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CLAUBERG AND THE DEVELOPMENT OF OCCASIONALISM

I

IN NO age was the effort to acquire knowledge more unremitting than in the mediæval period. Not often has mind possessed a livelier curiosity. If the Middle Ages be adjudged sterile with respect to knowledge, at least with respect to that knowledge now called science, it was not for lack of zeal. Moreover, the conviction of the utility of knowledge was not lacking. Alchemy and astrology were nothing if not efforts of mind to assist in the control of human destiny. There is but a half truth and not a whole truth in the statement that Modernity is marked by the ideal of the control, through knowledge, of nature in the interests of human welfare. Nevertheless such statements as these are seemingly paradoxical.

What, then, is the reason for the appearance of paradox? What is the difference between the meaning and employment of knowledge, and especially knowledge of nature, in the Middle Ages and in Modernity? The difference does not reside in the depreciation of knowledge by the one and its appreciation by the other, whether we think of knowledge as an end in itself or as an agency of control. Both ages are in agreement that through knowledge the control of human destiny is to be assured. The difference turns upon dissimilarity in the conception of what constitutes the destiny of man, and of what constitutes human welfare. By the mediæval mind this destiny and this welfare were defined in theological terms. Human welfare was salvation of the soul. The end of man was delineated by Revelation; the application of knowledge for the control of human life was directed to the attain-

ment of this end, and the Church was the agency of its accomplishment. The Christian Epic, to summarize by adopting Santayana's phrase, defined the boundaries of nature and life and human welfare. The progress of knowledge must occur within the sphere thus defined for the imagination. Advance in knowledge meant the increasing convincingness of the intellectual presentation of the doctrinal content. It meant augmentation of the power of the Divine Institution, practical efficiency in bringing the human race to salvation. These things implied the growing effectiveness of control over life and a more adequate direction of human energies towards the consummation of its destiny. Nature was not forgotten. Perhaps it is erroneous to think that Nature was not construed in what were thought to be its own terms. Given the drama of Salvation as defining the world for imagination, to view comets and plagues as portents and disciplinary functions was, for that mentality, to conceive nature in its own terms. To exorcise a demon or to suppress heresy was to be intensely practical when nature, conceived as a hierarchy of means and ends, is the scale or ladder of things leading to God. To realize on earth the Kingdom of God required the control and effective alteration of Nature, and of the inner and outer man. There remained, of course, the qualifying thought that, even were this embodiment of righteousness attained upon earth, it would be only a prefigurement and a symbol of a transcendent destiny.

That such statements are not a matter of words only is indicated by the character of the early modern reaction. This reaction did not involve a rejection of Mediævalism as such. It did not cast to one side, as so much rubbish, the mediæval scheme of things. The radical step taken with the inception of the modern point of view was a sundering of the mediæval whole into two portions. The distinction was made between that which is theological and that which is natural: the subject-matter for theological investigation is separated from the subject-matter for the investigations constituting the philosophy of Nature or science. The mediæval integration of theology and science, of God and Nature, is laid to one side. The statement that the mediæval mind conceived man and Nature theologically may be misleading; it suggests that the mediæval mind brought together two things that

could have been and had actually been conceived in their separability. But such a statement reflects Modernity's view of Mediævalism, not Mediævalism's view of itself. The modern mind began with the assumption of the position that the study of nature could be conducted independently of theology and theology could flourish independently of the former type of investigation. The Christian Epic, in the large sense, was not rejected. It was excluded methodologically from the study of the stars, or of human anatomy and physiology, of human nature and society. But many of those who were inaugurators of the new movements proclaimed, and with sincerity, their fidelity to ecclesiastical authority, to Revelation, and to the destiny of man as defined in the Drama of Salvation. The epistemological and metaphysical sceptic did this. The founders of mathematico-physical science did it. Despite the differences between Protestantism and Catholicism, this twofold loyalty was common to protestant and catholic innovators alike. Perhaps the generalization may be hazarded that ultimacy of explanation was recognized as given by the mediæval scheme, while men were sceptical of obtaining knowledge by the application of this scheme to the details of life and nature. Or, rather, knowledge (at least of nature) is taken to mean something for which mediæval patterns of thought are useless. Theology becomes the horizon of the field of natural inquiry. It is supposed to encircle and indeed to define this field. Inquiry, attaining this limit in its exploration, is supposed to recognize the limitation with due humility. So the theologico-epical scheme becomes a final refuge when independent interpretation of things reaches its ordained boundaries. Thus Occasionalism appealed to divine operation when the explanation of the relations between things seemed to terminate in insuperable contradictions. While this plan secured a somewhat qualified independence for investigation, at the same time it retained the comforting assurance of the ultimate harmony of the results obtained with the traditional cosmic scheme.

How this breaking apart of the mediæval whole came to be effected is the point needing explanation. If for modernity mediæval science and its applications did not seem to be science at all, whether pure or applied, it was not because the newer mind took from the very first a radically different view of the essence of

human welfare and of the final destiny of man. It appears necessary to think that, having separated nature and life in their details from the traditional view concerning ultimate ends and meanings, the new reaction on its negative side was a matter of detail and not, so to speak, a sweeping wholesale rejection of the mediæval standpoint. Perhaps this two-sided reaction was in part born of sheer weariness. The geocentric and anthropocentric theory concerning the structure of the solar system fitted very neatly, on the whole, the mediæval epical scheme. Dissatisfaction arose, not because the epical scheme was cast aside altogether, but because the details resulting from improved processes of observation could not be fitted into the geocentric plan without excessively complicating it. There is something genuinely expressive of historical fact in the story of the king who, stupefied by the complexities of that Ptolemaic astronomy, felt he could have given the Creator some good advice had he been present at Creation. The separation of the epical schema and the investigation of nature and life may thus have been suggested by the impossibility of carrying out the arrangement in detail. And the separation, in the measure in which it was effected, in turn coöperated with other elements to turn attention to more accurate observation and interpretation of the details. All those factors commonly enumerated in explanation of the modern reaction—the widening of the intellectual horizon by exploration and discovery, inventions that increased confidence in human resourcefulness, the growth of industrial interests—cooperated in this process of disentangling the general scheme of Mediævalism and the detailed tasks of investigation in the field of the natural. Newer purposes conceived as practical aims for mankind suggested new ways of observing and interpreting nature and human nature. And reciprocally, as the latter showed results, new aims for man and society, new goals of effort, emerged. Modernity perceived the futility of mediæval science and learning, with its alleged uses, not merely because mediæval science and learning were illegitimate in principle, but just as much because they seemed irrelevant (rightly or wrongly) to newer ideas as to what human welfare consists of and as to when it can be found. All ages yearn for Salvation; they differ only with respect to what

Salvation is and how it may be attained. Even a slight change in the notion of what Salvation is will involve changes in the methods of getting it. It is even more obvious that the conviction of success as to method will rapidly change the content of the term. Of course, the claims of the Church were admitted. Men insisted upon the truths of revelation and theology. They acknowledged the theological definition of human welfare and destiny. But these admissions concerned the horizon of thought and feeling and action.

These acknowledgments were sometimes mere prudential gestures. On other occasions they expressed the belief that one could both eat and have his cake; the separation of the natural from the supernal, of the field of independent investigation from the field of investigation under the controlling guidance of revelation and authority, suggested the conviction that men could live naturally and die theologically. Men sought everywhere for a new method of controlling this life—and, thinking they were discovering it, tried to turn the results into a new approach to the salvational horizon. It is not in physics alone that men looked for new ways of getting things done. De La Chambre's Art of Knowing Men, with all its absurdities, was intended to be intensely practical. This art and its alleged possible fruits fell within the cosmic circle of the mediæval schema, and De La Chambre was not prepared to question its finality. He would substitute physiology and psychology for exhortation and exorcism, and political leadership for clerical guidance in the control of life, of *this* life. The other life was to remain in charge of the clerics. Within the more restricted circles of daily human affairs there was room for a knowledge and an art, efficacious for the control of human welfare.

Modernity began its intellectual history, not with a radical redefinition of the task of mind, but with hesitating substitutions and apologetics. It did not separate what had been confused. On the contrary, it sought to break apart a system, singularly unified in spirit and in principle. Rejecting one fragment, it preserved, with tenderness, the other. Faced with the need for verification, the early modern mind could find it only by relating the parts in external ways. As the delineation of spheres of influence in

world-politics breeds quarrels, so with this device of the modern mind. The mediæval tradition comes to define, not the power of mind, but its frailty.

II. NATURAL EFFICACY AND DIVINE PROVIDENCE

From the generality of the preceding description to the details of Clauberg's philosophy may seem to be a large step. The general setting, however, is part of the explanation of the twist that Clauberg gives to Cartesian doctrine and of his sensitivity to certain of its difficulties. He was reared, we are told by Bouillier,[1] in the reformed faith and in great piety. He became a professor of theology and philosophy, and an excellent expositor and defender of the Cartesian doctrine. Faithful to Cartesian teaching on the whole, and even in many details, he extended and altered it in other respects. It is probable that his Protestantism and its theology were influential in many of these departures from strict Cartesianism.

The problem of the relation of body and mind engrossed Clauberg's attention. The doctrine of the master, of course, had made connection, interrelation, or commerce of either with the other a perplexity. The body-mind question came to take a form that made it an instance, although it becomes the most aggravated case, of a very general problem. The task of natural science was, in general, the observation and interpretation of the constant relations found within the system of things. With things of the same order of existence this task presented difficulties enough, as is indicated by the efforts to comprehend the transmission of motion from one thing to another. The Occasionalists raised the question why and how one object, striking another, set the second thing in motion. The thing moving possesses its motion. How can it lose that motion? How is the latter, so to speak, detached from the thing and transferred to a second thing? The facts as directly observed reveal no transmission of motion. What perception indicates is a proportionality in the behavior of things—an interadjustment or correlation. The alleged causal operation of one thing upon another is diluted into the undeniable fact of orderly interrelation. Causes are occasions. What is observed must be in-

[1] *Hist. de la phil. cartésienne*, 3rd ed., I 294.

terpreted in this way, that God, on the occasion of the contact between two objects, effects the diminution of the motion of the one and the beginning of motion of the other. Thus the relatedness of things implies God.

But when the things related are found in wholly dissimilar fields of existence the problem is aggravated. Body and soul, extension and spirit, in some sense correspond; they function in harmony and agreement, or form a coöperative unity. Observation suggests this. Teleological conceptions would reinforce it. This vague notion was a commonplace. Witness Locke's steady correspondence (the work of God) between ideas of secondary qualities and the real properties of things; or the notion of sensation as useful signs, indicated by Descartes. The body could not be regarded merely as a prison of the soul and an impediment to the spirit. Modernity had discovered nature as a system whose order is expressible in mathematical terms, which gave an opportunity for exactitude and generality of knowledge. Moreover, it was discovered to be a vast machine comprising many machines. When the human body is taken as a machine, the correlating of the welfare of the soul with the welfare of the body becomes an irresistible thought. If the body be an instrument of the soul, then the efficacy of the instrument means precisely the exquisite perfection of its design as a machine. Again if the machine-body has a soul attached thereto, it assuredly exists in the interests of the nobler thing, and the soul must be adjusted to the body in a manner insuring the soul's sensitivity to the condition and operation of its adjunct. Such a view very naturally falls between mediæval conceptions and the simplification of later materialism or spiritualism. Even though philosophers were placing sensations and perceptions within the mind, and so leaving the external world as something with which contact was made by way of a state of the soul, they were not yet prepared to deny the existence of that external world as a brute fact demanding recognition. They were still less prepared to overcome the duality of existence by defining the material world as a phenomenal manifestation of the spirit. God had created it, of course, but as created it was there and must be reckoned with. Descartes had defined its essence. And it had been defined as the antithesis of soul-substance.

The account of the body in mechanistic terms was, in effect, a disguised but more perfect teleology. And so the study of bodily structure and function tended to confirm, rather than to lessen, the conviction that the natural welfare of man could be read from the structure of his body.

The union of soul and body was in one sense natural, for man was a part of Creation. And there *is* a *union*. With regard to the antithetical character of the component parts, the actuality of this union might seem impossible. Why should not the states of the soul happen in their own order, and the occurrences in the body and in nature in an order wholly belonging to nature, without the possibility of relating the one to the other? Why should the conviction of systematic relation or harmony be forced upon us, when, since the substances are wholly disparate, no regularity and no correspondence could be deduced from the bare existence of the antithetical substances? What sense could be given to such a statement as that a percept in the one corresponded to an event in the other? It is apparent that to have doubted this correspondence would have been to imply the deceitfulness of the Creator.[2] One might add that a failure of correspondence would have implied not merely the deceitfulness of the Creator but our inability to relate created mechanisms—the mechanism of perception, for example—with notions of utility, and so would imply a questioning of God's providence. If teleology cannot be translated into mechanism in the case of the human body, then in what instance can we effect the translation? If God's Providence is to be retained when things are taken as machines, this retention must be possible in the case of the human body or it must be rejected everywhere.

After all, Descartes had never denied this systematic coherence of the bodily and the mental—he had only made it a metaphysical problem. The problem was framed in such a way that no solution is possible so long as we confine attention to the two finite substances. The body-soul problem, crucial as it was, had to be placed within a wider setting.

The problem, then, falls under the scope of two conceptions. In the first place, it must be considered naturalistically, so to

[2] This would follow, of course, from *Meditation VI.*

speak; in accord, that is, with the general spirit of the new standpoint of inquiry. Clauberg does not ask why there is a material world at all—it is indubitably there. Not asking this question, he does not raise the metaphysical question: why has the mind a body at all? The relation of soul and body—assuming without question the dualism—is to be viewed naturalistically. Studied as any other relation between created things is to be studied, it must be conceived in terms of vital function, of practical efficiency. The meaning of the union of disparate substances is incidental to man's career in a cosmos of things. In this there is an expression of the characteristic conception of control, of the strain of practical interest running throughout even the most theoretically independent efforts of early modern thought.

In the second place, however, the union of the two disparate substances, unquestionable as fact, is also unquestionable as an illustration of God's providence. But it remains inexplicable in terms of vital function and practical efficiency alone. When we have conceived the orderly relation of these substances in terms of efficiency, there remains the persistent problem how there can be any such efficiency, and why there should be any such union at all. The limited investigations of physiology, neurology, and physics, may explain in some detail the meaning of this efficiency. But they cannot make intelligible the assumptions that must be made before this efficiency is investigated. This more fundamental question leads us to the horizon of thought—and there the mediæval schema provides the solution. In this fashion Clauberg solves the Cartesian problem by turning efficiency into God's providence.

III. THE CRITIQUE OF FORM

This general statement may serve by way of outline. To it we shall return after a survey of Clauberg's doctrine.

Clauberg's Physics follows Descartes quite faithfully. Physics is the science of natural things.[3] Metaphysics has the supernatural

[3] "Physica est scientia rerum naturalium." Hereinafter quotations from the *Opera Physica, id est, physica contracta, disputationes physicae, theoria viventium, & conjunctionis animae cum corpore descriptio* (Amst. 1691), will be indicated as follows: *Physica contracta, P.C.; Disputationes, D.P.; Theoria viventium, T.V.;* and the portion described as *Corporis et animae in homine conjunctio,* etc., as *C.* The work entitled *De Cognitione Dei et Nostri, quatenus naturali rationis lumine, secundum Veram Philosophiam, potest comparari, Exercitationes centum, Duisburgi ad Rhenum,* MDCLVI, will be referred to as *C.D.N.*

for its subject-matter. The subject-matter of physical science, however, is corporeality. Corporeal things, considered generally, consist of things extended in three dimensions. A thing without length, breadth and thickness is nothing—that is, so far as we refer to corporeal things, to which alone extension belongs. Qualities, asserts Clauberg, are not things at all.[4] He is sensible of the economy and simplifying power of the Cartesian definition of matter. He refers to Occam's razor and asserts that extension is a sufficient basis for motion, figure, position and all other accidents.[5] Cartesian physics needs defense, however, and Clauberg proceeds to a support of the definition of matter as in essence extension. To figure, situs, motion and rest we can refer divisibility, continuity, magnitude, rarity and density, porosity and solidity, place, distance and the like. Various sensible qualities such as color and sound are perceived in corporeal things. To these philosophers add occult qualities, and regard the latter as having the same origin as the sensible or manifest qualities in the substantial form which determines the nature of each thing.

Now it is most interesting to note that Clauberg's defense of the Cartesian notion of matter is an attack on substantial forms, and that the attack is based on the assumption of the Cartesian dualism. If the essence of body consist in substantial form, he argues, this form is either material or immaterial. If the latter, it cannot be constitutive of materiality. The point is that this objection would be irrelevant were the distinction between the material and the immaterial merely the traditional distinction between matter and form, rather than the Cartesian distinction between extension and spirit.[6] He proceeds to urge that if the form be material, the question remains what the essence of the material thing is, for form neither as a name nor as a notion satis-

[4] *D.P.*, Disputation III. In *P.C.* Ch. iii has an interesting title, as follows: *Corporum formae intelligibiles & utiles: quantitas, figura, situs, motus, quies: in Physicis & Mathematicis, naturalibus & artificialibus spectandae.*

[5] *D.P.* IV.

[6] *Cf. C.*, Ch. xlvii. "Animam corporis formam nec assistentem, nec informantem esse." We can with equal propriety argue that the soul is the form of the body, or the body the form of the soul. "Si anima rationalis corporis humani *forma* est, quia motus varios imperando variis illud modis format ac disponit, intuitu situs & positionis partium . . . cur non simili jure corpus dicatur forma animae, quoniam varias in ea perceptiones producendo eam format ac disponit mille modis?" (Sect. 9.)

fies the problem. To distinguish between particular things, we must add the notion of accidental forms to that of form. We can, however, accept only that which we clearly and distinctly perceive, and with occult qualities physical science can never be constituted. The context seems to indicate that, for Clauberg, the sensible and the occult qualities stand or fall together when the problem of a universal physical science is envisaged.[7] With respect to the sensible qualities there exists a general and a special prejudice. The former is the belief that all bodies are sensible and, accordingly, that there can be no body where we have no sensible effects. And so for many adults and learned men body cannot be defined in any other way than in terms of sense. The more special prejudice concerns the feeling that there is more corporeality in heavy things such as stones than in air; so the notion arises that the degree of corporeality varies with weight and hardness.[8]

Reference to the facts of experience—to the variability of the qualities of things—shows that bodies can retain their true nature, *i.e.*, extension, while changing, or losing their qualities. The same thing can be now hard, now soft. But the essence of body cannot consist in those properties which are variable. This conclusion is reinforced by the consideration that the unity of the world cannot be defined in terms of qualities. Extension is therefore the essence of matter and the principle of the unity of the world.[9] Clauberg recognizes that the new physical science is even more a reaction against the misuse of the concept of form than a reaction against the notion as such. Moreover, there is the additional difficulty of limiting the term to the observed qualities of things while escaping the ramifications of the idea into the realm of the fantastic and occult. This is the reason for his insistence that forms are to be admitted only in so far as their existence is certain, denied by no one; only in so far as they are manifest to all men as belonging to extended and divisible matter; and finally they may be admitted only when we have as clear a definition of form as we have a distinct conception of matter itself.[10]

[7] *D.P.* VI, sect. 2.
[8] *D.P.* VI.
[9] *D.P.* VI, sect. 6 and ff.; Disp. VII, VIII, IX.
[10] *D.P.* XII, sect. 3.

Thus form, if it is to have an acceptable meaning, must apply equally to celestial and sub-celestial things.

This virtual rejection of the mediæval notion of form, however, is recognized by Clauberg as bringing in its train the problem of finding a substitute. The newer definition of matter as extension increases the possibility of discovering the universal properties common to all things. For scholastic science the forms provided a basis for the differentiation of one thing from another. A thing, indeed, was a collocation of forms caught into unity by a shared inherence in matter. The diversity and specificity of things can be understood as the result of diversity and specificity in the combinations of the forms. The new physics must furnish a substitute means of expressing the particularity of the thing. The diversity of particular things must be conceived as variations in properties that are universal. But the new physics turns the relation of sensible qualities and matter as extension into a problem. Accordingly, it cannot define matter as extension and resort to sensible qualities as the means of differentiating one thing from another. Clauberg recognized that forms and sensible qualities involve a qualitative point of view; and he perceives that the new science is quantitative rather than qualitative. He urges that, since the greater portion of the material world is insensible and imperceptible, sense-qualities cannot be universal. Therefore they cannot provide the basis for the distinction of things from one another.[11]

With these trains of thought another coincides in effect. This is the doctrine of the subjectivity of sense-qualities. Through habit we are led to attribute to bodies the qualities of sense. Body, it is true, can exist in the absence of man and his senses.[12] Hardness, for example, is merely the experience of resistance. For Clauberg, the source of all the errors of the scholastic physics may be described as follows: the first step was to regard the sensible qualities as objective, or at least to assume them to be so without contemplating the other possibility; then, in conception, the qualities, thus taken as objective, are duplicated by just so many intellectual distinctions. Finally, thanks to the notion that logical considera-

[11] *D.P.* XII, sect. 7.
[12] *D.P.* VI.

tions, which have to do with mind alone, are really principles of the nature of things outside the mind, the qualities are thus surreptitiously reified. Of course, once this procedure is followed, the reification of qualities will not be confined to what may be called the natural qualities of things, but will be carried on to include whatever entities are suggested by the distinctions of intellect. In this way the occult qualities are added to the natural and sensible.[13]

The general character of the Claubergian-Cartesian physics has been indicated. God is the first cause of motion. The quantity of motion in the universe is a constant. A thing is essentially a certain quantity and tends to persevere in the same state.[14] The variations in things can be reduced to differences in figure and in the combination of motion and rest. On the whole, Clauberg regards the Cartesian method as really a reversing of the scholastic. The latter begins with being in general, and then proceeds to body in general; from this point it moves to celestial things, and after this deals with sub-celestial things, such as man, animals and plants. Thus the scholastic method acknowledges the hierarchical arrangement demanded by theology. But Descartes, as Clauberg urges in defense of his method, begins with natural things, not as they are in their perfection, but as they are in their simplest properties. From this he passes to the Supreme Cause. Clauberg, it seems clear, sees the Cartesian doctrine mainly in its outward contrast with scholasticism while its radical difference in principle and in outcome largely escapes his appreciation. Quite naturally he thinks of the Cartesian doctrine as lying within the circle of the mediæval schema.

IV. BODY AND SOUL

Clauberg, like so many followers of Descartes, is acutely conscious of the problem of the relation of body and mind as this

[13] *D.P.* XII, sect. 18.

[14] Clauberg formulates what he describes as the first, second and third laws of nature in the following way: The first law of nature is: "quod unaquaeque res quantum in se est, semper in eodem statu perseveret; sicque quod semel movetur, semper moveri pergat." The second: "quod omnis motus ex seipse sit rectus, & ideo quae circulariter moventur, tendere semper ut recedant a centro circuli quem describunt." The third: "quod unum corpus alteri fortiori occurrendo nihil amittat de suo motu, occurrendo vero minus forti, tantum amittat, quantum in illud transfert." *D.P.*, XIX, XXI, XXII.

is defined in the Cartesian philosophy. When one recognizes how men of lesser stature were wholly dissatisfied with the situation, and especially with the artificiality of the pineal-gland theory, one wonders why Descartes did not express dissatisfaction. Perhaps there lay hidden in his mind the thought that, after all, body and mind are finite substances, and the unity of man is not the unity to be found in the infinite substance or God. The complexity of the situation made the pineal-gland theory, from the standpoint of physical science, both a necessity and a means of eluding difficulties. In the epistemological sense, man is essentially mind, a knower, the subject; and the subject is a principle of rationality set over against a subject-matter, nature or extension. The human body falls within the limits of that subject-matter. But the human being is also a subject-matter for natural inquiry. The human being is therefore a part of the problem of physics. Feelings, perceptions, thoughts and volitions, however, fall outside the definition of the field of physics. Facts of this order must be studied in their own terms. But sensations, images and the like, seem to be terminations of a causal process beginning with some outside object. The relation of the final term in the causal chain to the earlier terms must be of interest to physics, and yet it lies without the field of physical inquiry. The metaphysical distinction between the finite substances, however, plays a fundamental rôle in the determination of the subject-matter of physics. A universal physics is possible from the Cartesian standpoint only on condition that within the mental substance shall be placed sense-qualities and the passions. In the circumstances, the pineal-gland theory is an intelligible hypothesis for science.

Clauberg is evidently of the opinion that the Cartesian dualism, with its attendant physiology and the theory of the automatism of animals, needs further integration. He begins with an exposition of the doctrine of the animal spirits. The behavior of animals, he affirms, can be explained wholly by the movements of the spirits and by bodily structural harmony and interrelation (*confirmatio membrorum*). The difference between a living and a dead body, whether that of a man or of an animal, is said to be like the difference between a clock properly constructed and having the principle of corporeal motion and the same clock that, when

broken, ceases to move because it has lost its principle of motion.[15] Animals are machines and God made them. There is, accordingly, nothing to wonder about with respect to them. On the other hand, and by contrast, the union of soul and body in man is genuine matter for wonder. At this point Clauberg indicates why the Cartesian theologian finds the doctrine of animals as machines wholly congenial. Immortality follows necessarily from the very nature of mind. Were animals anything more than machines—did they possess soul—the immortality of animals would follow. This, for Clauberg, is a *reductio ad absurdum* for the claim that animals are more than machines.[16]

How are we to discover what belongs to mind and what to body? And when the apportionment has been made, just what form does the mind-body problem assume?

In replying to the first question, Clauberg enunciates two principles that should govern our investigations of living beings, especially when there is in view the apportionment of the facts between matter and spirit or body and mind. In the first place, he states, anything that we observe in ourselves of such a nature that it can belong to inanimate bodies also must be attributed to body

[15] *T.V.*, Chs., xxi, xxii. To the principle of motion in animal bodies Clauberg attaches the traditional term, *anima*. It seems clear that for him the animal *anima* is but a name for the animal spirits. He uses, as a matter of convention, the expression, the animal soul. However, in certain passages he seems to suggest that sense and appetite may belong to the animal soul; and this would mean, of course, that sense and appetite belong to corporeality and must therefore be excluded from the rational soul. This suggestion may express a characteristic difficulty experienced by others besides Clauberg. It is relatively easy to deny the rational soul, that is, rationality, to animals, but the similarity between animal and human bodily structure makes it less easy to deny them sense and appetite, sensations and desire. Whether there is here an inconsistency in Clauberg, or merely a misleading conventionality of expression, may be left undetermined. His main doctrine is certainly uncompromising in its dualism. *Cf. T.V.*, Ch. xxii, sects. 519 ff. Moreover, he criticizes the arguments from the similarity of structure. This, he states, leads men to think that the difference between men and animals is a matter of degree only. Vulgar opinion argues that, since beasts possess eyes and ears as do we, they must see and hear in a fashion comparable to ours. As the Nigger Jim in Huckleberry Finn refutes the proposition that the French do not speak English but another language by urging that since the French are men they must speak as men speak and therefore speak English; so Clauberg urges that if similarity of structure means similarity of function, then animals should speak in our manner, since they possess tongue, teeth, lips, and other organs adapted for the formation of the elements of speech. It is particularly important to note that the refutation is made to refer not to thought, but to sensation and perception.

[16] *T.V.*, Ch. xxii.

alone. Secondly, anything that belongs to man, but can in no way be conceived as pertaining to any body whatsoever, must be attributed to our soul (*anima*). In this context *anima* means, not the principle of motion or the vital "go" of the body, but a spiritual entity, as is shown by Clauberg's illustrations. Motion and heat, he points out, by the first test must be attributed to body, *i.e.*, to matter; while cogitation, intellect and will cannot be attributed to any body whatsoever.[17] He asks what possible affinity there can be between cognition and corporeality. Significantly, he continues in these words: "hoc est, inter longitudinem, latitudinem, . . . & cogitationem, perceptionem, judicium. . . ."[18] With this goes his emphatic rejection of what he calls the common notion that the soul can be divided into the vegetative, sensitive and rational souls.[19] The Cartesian dualism cuts across this triple hierarchy of functions; the functions must be unambiguously assigned either to body or to soul. From Clauberg's standpoint, the sensitive and vegetative souls, if they are to have any meaning at all, must derive that meaning from the bodily mechanism. They are but names of bodily functions.

What, then, is the nature of the human mind? Our philosopher finds that many definitions are unsatisfactory. He would reject those derived from the negation of materiality, from the notion of form or even from the notion of mind as *spiritus* or *res spiritualis*. Of course he has already excluded vital principles as giving the nature of the soul. What remains as the central fact of mind?

At this point Clauberg's doctrine affords a capital illustration of the manner in which the consequences of the Cartesian doctrine operate. Descartes, in the first instance, adopted the body-mind dualism, which lay ready to hand, *in the interests of a logical and epistemological problem.*[20] His first interests are defined by the problem of attaining a principle of certainty. The context of the "cogito" is first of all epistemological. The "cogito" does not imply the fact of self-consciousness as the central element in the definition of mind. It is rather the affirmation of rational certainty. The only test of certainty—the only meaning that can be given

[17] *T.V.*, Ch. xxii, sect. 497.
[18] *D.P.*, XXXV, sect. 15.
[19] *T.V.*, Ch. xxvi.
[20] I have set forth in detail this position concerning Descartes in a contribution to *Studies in the History of Ideas* (Columbia University Press, 1925), 83-158. *Cf.* also the Introduction above.

it—is rational conviction. The dualism defines the subject as over against its subject-matter, or nature. In the prosecution of his work, however, Descartes is forced by the consequences of this position to alter the content of the dualism. The substance, the very nature and essence of which is to think, becomes the depository of what we should call all psychological and "psychical" facts. Everything excluded from matter, and therefore from the body by a mechanistic physiology, is deposited in mind. Mind becomes *res cogitans*, and thinking comes to comprise anything and everything that, being incompatible with extended substance, is existentially of a different character. Thinking and being conscious, thought and conscious states, become equivalent terms. As Brunschvicg puts it, *ego sum* degenerates into *ego sum Cartesius*. The field of and for psychology is defined, and epistemological problems turn upon this psychology.

Clauberg defines the mind as *res cogitans*. But what is signified by *res cogitans?* The answer is to be found by asking what we are aware of as the activities of mind. The mind is conscious of itself when it thinks, wills, doubts, chooses, affirms, denies, enumerates, ratiocinates, loves, hates, etc. etc. All this is implied by the one term *cogitare*.[21] Hence mind—*mens seu animus*—is *res cogitans*. But, in order that the human mind may be distinguished from that which is divine or angelic, it is necessary to add: *"finita corpori organico mutuo quasi foedere conjuncta."*[22] If a thing is *res cogitans* it is not extended, it cannot be divided or dissolved or touched; it is not produced by any corporeal force nor by it conserved or destroyed, affected, moved or given figure.[23] And therefore the principle of explanation that obtains with material things is foreign to the nature of the rational soul.[24]

Mental processes are divisible into two classes, the actions and the passions.[25] The actions of the soul are volitions and we experi-

[21] *T.V.*, Ch. xxv. "Mens enim si intelligit, cogitat, si vult, cogitat, si non vult, cogitat, si admiratur, cogitat, si ratiocinatur, cogitat . . . judicans cogitat, dubitans cogitat, recte sentiens cogitat, errans cogitat . . . (sect. 610). *C.D.N.* IV.

[22] *TV.* XXV, sects. 612-3.

[23] *Ibid.* sects. 615-8.

[24] *Ibid.* sect. 619: "Adeo ut omnes illae rerum materialium affectiones, quas Physicorum pars communis generaliter explicat, a natura Animae rationalis prorsus alienae sint."

[25] The human mind is "actus impurus seu mixtus" and thus has the faculties of *actio* and *passio*. God, however, is *actus purissimus*. *T.V.*, Ch. xxvii, sect. 650.

ence them as coming directly from the soul.[26] The passions are every kind of perception that comes into the soul.[27] The mind is related to its perceptions as wax to the various figures that it receives.[28] The two faculties, the active and the passive, can be distinguished but not separated. No perception, indeed, can be in the mind without implying the activity of the will.[29]

This apportionment of the facts between body and mind having been effected, the second question arises: what form does the body-mind problem now assume? What is the union or the character of the relation between the two? Quite obviously, perception and will define the problem. On the one hand, Clauberg never doubts the existence of an independent world of material things. On the other hand, pure thinking as such clearly is an intrinsic operation of the soul. But perception and will represent two sets of facts or at least of appearances; and the peculiar character of these facts, appearances or experiences lies precisely in this, that they seem to imply the impossible. In perception bodies apparently operate upon the soul; and in every act of will the soul apparently influences the bodily activities and accordingly seems to act upon matter.

With respect to perception the problem assumes several forms. In the first place, there is the difficulty of understanding how sensible qualities, which seem to be the properties of things, and to be given to the soul (so that the soul seems passive with respect to them), can really be not properties of things at all but states within and of the soul itself. But the sense-qualities are really states of the soul. How they even come by their appearance of being properties of things requires explanation. Our awareness is of things; but investigation discloses that what we are really aware of resides within the soul itself, and not in things. On the other hand, there is an even more fundamental difficulty. Our perceptions are variable and diverse. But experience forces us to the conclusion that this variability and diversity

[26] *Ibid.* sect. 651: "Actiones voco omnes nostras voluntates quia experimur eas directe ab animo venire."

[27] Passionem generaliter appello omne genus *perceptionis*, quae in nobis invenitur, quia saepe accidit, ut animus noster eam talem non faciat, qualis est, & semper eam recipimus ex rebus, quae cognoscendo repraesentantur," *ibid.* sect. 652.

[28] *Ibid.* sect. 655.

[29] *Ibid.* sect. 657-8.

is not due to the mind itself. Perceptions are not the product of an uncontrolled internal spontaneity of the soul. Their system and coherence seems objectively conditioned. In their variety and in their orderliness perceptions seemingly imply something lying without the mind as their cause. Moreover, the world of common sense consists of an immense diversity of particular things. For Claubergian physics this world is really extension. The diversity of things, *i.e.*, of perceptions, in so far as extra-mentally conditioned, must be reducible to variations within the common denominator of extension. Things, as they are in the material world, are definable only as combinations of spatial dimension and motion. If the qualitative diversity that marks the commonsense world be transported into the soul as its perceptions, nevertheless that diversity must be related to and held in correspondence with the field of extension. The qualitative similarities and differences, which seem to be thrust upon the soul or to be evoked within it by a power operating from without, imply an objective order.

Thus, for Clauberg, the problem of the relation of mind and body, so far as suggested by perception, is essentially one of rendering intelligible the correlation of perceptions and things. The diversity and systematic coherence of the perceptions must be related to a diversity and coherence, not qualitative but quantitative, that is intrinsic to the nature of the material world. The crucial fact is this, that we cannot escape the conviction of a perfect correlation between the perceptions of the soul and conditions in matter.

Interaction between mind and matter is impossible according to the position of Clauberg. The correspondence of perception and material thing can therefore not be due to a causal influence of matter upon mind. By "cause" we can mean only occasion.[80] Things, with respect to states of mind, can be only occasioning causes. Cause in the sense of occasion expresses the fact that there is no interaction between the two substances and also that there is a steady correlation between them. This, so far as the *Theoria Viventium* carries the matter, *is* the union of soul and body. Clauberg's thought may be expressed by stating that science cannot carry the problem further.

[80] "*Causam* intellige, quae excitat vel occasionem dat", *ibid.* sect. 665.

In physiologico-psychological terms, of course, the question can be more narrowly defined. The mechanistic account of perception implies that the correlation between perception and thing is really the correlation between the perception and the states of the brain. The diversity of perceptions corresponds to the diversity of motions of the animal spirits. Clauberg furnishes the customary account of the mechanism of perception. The first stage is the excitation of the bodily organ, which movement is transmitted to the brain and terminates there.[31] But it is the *animus* that perceives, not the sense-organ. The second step is the perception proper, *perceptio mentis;* the third step is judgment, *iudicium, seu animi assensus vel dissensus.* In this third stage alone can error arise.[32] The bearing of this is obvious: the correlation of perception and physiological process within the brain is constant and perfect. The apparent failures of the perception and extra-organic conditions to agree will be due, in the first place, to a mistaken insistence upon the correlation of perception and extra-organic conditions, and in the second place, to erroneous judgment.

The dualism of spirit and matter, of *res cogitans* and extension, distinguishes the psychological from the physiological and physical. Since the dualism underlies this very distinction of fields of existence, we cannot draw directly from the material or the psychological facts any solution to the problem presented by the correlation of perception and material conditions. The formulation of the correspondence in terms of occasioning cause defines the problem of the union of soul and body as the problem of finding a metaphysical ground for the occasion. The mediæval frame of ideas, with due revision, provides the answer.

(To be concluded)

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[31] The mind is said to be more closely united with the brain than with the body as a whole, *T.V.*, Ch. xxxii.

[32] Clauberg explains the image in terms of brain-habit; the spirits find it easier to go through pores through which they passed on previous occasions. *T.V.*, Ch. xxxix, sects. 951-2. Clauberg's physiological psychology is completed by the study of the passions, which of course are said to be due to the fact that man is composed of body and soul. The immediate cause, *i.e.*, occasion, of the passions is the *agitatio* of the spirits; while the more remote causes are such factors as attention, the "temperament" of the body, and objects themselves.

LOCKE'S THEORY OF IDEAS

IT HAS long been common to dispose of Locke simply as a representative perceptionist. This interpretation has been made by so many writers that it would be quite superfluous to cite any particular examples. There is a certain obvious possibility, in the domain of epistemological discourse, designated by the phrase Representative Perceptionism, and certain passages in Locke have lent support to the view that it was he who, especially, of all philosophers, fell into the snares and pitfalls of that theory. The doctrine in question may be briefly stated in the proposition that perception of surrounding bodies (and ultimately of our own bodies) takes place by means of certain representative images or phantasms which are sometimes also called ideas. A prize example would be the visual appearance of a star which may, for all we know, have ceased to exist millions of years before our perception of it occurs. In spite of a certain *prima facie* plausibility of this theory it is commonly supposed to have a tendency to lead those who accept it to the doctrines, whether good or bad, called idealism or subjectivism. The mental intermediaries, at first supposed to be necessary to an explanation of perception of outer things, tend to act as screens which conceal bodies from us. So the existence of material things becomes doubtful and is finally denied by idealism and phenomenalism. Thus those who attempt to restore realism are likely to be suspicious of ideas and inclined to deny their existence. It is well known that the New Realists offer various theories of direct perception and hold that the external material thing actually enters the mind in the act of sense-perception. The Critical Realists have found themselves forced to resuscitate "ideas" and to defend their existence together with the doctrine of the *transcendence* of the object. This new school maintains that the physical thing itself is never actually sensed or intuited but is only intended or referred to by the perceiver.

It is not the purpose of the present paper to discuss this interesting development for its own sake. I am rather moved to come to the defense of Locke and to attempt to show that, in spite of certain unfortunate definitions, he was not primarily a representative perceptionist, and that his doctrine of ideas has a totally

different meaning from that frequently attributed to him in epistemological discussion. It will be seen that taking *ideas* in the sense in which he actually uses the term in the body of his lengthy *Essay* (which is far more logical than psychological) the problem of representationism does not arise, or rather that, in so far as it does arise, it can be solved and removed to the satisfaction of realism. A common assumption, which has served to prevent an accurate understanding of Locke, has been that his chief significance was to be found in the systems which followed him. He has thus come to be understood chiefly in the light of Berkeley and Hume, although there can be no doubt that he would have repudiated the views of these men. Clearly a man can be responsible only for his own utterances. It may also be remarked that Locke's system was the product of a lifetime of reflection, while the systems of Berkeley and Hume might *almost* be regarded as the exaggerated distortions of two very clever young wits who were more interested in making names for themselves than in the gaining of sober truth. Berkeley was obliged to recast his system in later life and to bring it into line with the Platonic tradition in English thought, which had, at an earlier time, been represented by Cudworth, while Hume was obliged to confess that his psychologism and skepticism represented an attitude wholly incompatible with the demands of real life. Such a work as Gibson's *Locke's Theory of Knowledge* might well assist us to a more proper evaluation of Locke as a shrewd and penetrating critic of knowledge. We should find that Locke, for better or worse, gave little attention to the problem of the psychological mechanism of perception (which seems the chief concern of contemporary realists) but far more to fundamental questions of the theory of *knowledge,* in the proper sense of the word.

The key to the understanding of the philosophy of Locke would seem to be in the same general locus as that to the understanding of the system of Plato, namely, in the theory of ideas. The refutation of the old Platonic doctrine of innate ideas, however, which some spirit of controversy led Locke to place at the beginning of his *Essay concerning Human Understanding,* has served effectively to conceal some of the fundamental tendencies of the *Essay* itself, which, in certain definite respects, is far less at variance

with the teachings of Plato than is commonly supposed. Thus Locke has commonly been classified as an empiricist, although his claim to this title is not altogether clear. No one, of course, can deny that he teaches that all *ideas* are derived from experience but it is sometimes forgotten that he also teaches that all *knowledge* of universal truths (as well as of one's own existence) is founded in intuition. In fact, Locke's critique of what he regarded as the established dogmatism hardly went further than to substitute intuition, *i.e.*, the test of clear and distinct ideas, the power of one's own thought, for the accepted vague and mystico-psychological doctrine of innate principles. The virtue of thinking for one's self and accepting only that which is evident is extolled quite as much by the continental rationalists as by those who are commonly called empiricists. If we venture to use the word *intuition* in the sense in which it was understood by Descartes, Spinoza and Locke, it would be quite proper to describe Locke as an intuitionist, since he believed that all knowledge of universal truths was either intuitive or derived from intuitions. His empiricism, in a deeper sense, is found in his fundamental belief that there can be no intuitive or rational understanding of nature, but only a groping, experimental, method. Intuition deals, save in the case of one's own existence, merely with the universal relations of ideas. Yet in this respect we may detect a certain kinship with Platonism.

According to the current interpretation of Locke, his *ideas* are certain mental phantasms, which come between the mind and its object in the act of sense-perception. This interpretation, however, ignores one of the most pervasive features of ideas in Locke's system (although one which seems to have been concealed from Locke himself), namely, that all his ideas are treated by him as universals. They are, when once they have been "suggested to the mind" by sensation or reflection, permanent possessions which may be applied to indefinitely many objects. The mental phantasm, which exists in the mind when we perceive some material thing (what modern epistemologists call the *sensum* or *sense-datum*) would be called by Locke simply a sensation but not an idea.[1] The

[1] I should imagine that Locke would have denied that Lovejoy's admirable *Revolt against Dualism* was concerned with the existence of ideas at all but rather with the existential status of sensations. The recognition of the existence of *reflection* as a distinct source of ideas would have rendered it

modern practice of distinguishing between *sensing* and *sensum*, innocent as it appears, nevertheless presupposes the possibility of the existence of a *sensum* apart from a *sensing*. In all probability Locke would not have granted the propriety of the distinction but would have put forward such arguments as Berkeley uses[2] to show that there is no real difference between *sensing* and *sensed* but only a *distinctio rationis* such as may be drawn between feeling a pain and the pain itself.

The definitions of *idea* given in the Introduction to the *Essay* run "whatever is the object of the understanding when a man thinks", "whatever is meant by phantasm, notion or species", and "whatever it is which the mind can be employed about in thinking". The second alone of these alternative definitions gives support to the supposition that Locke's *ideas* were existent phantasms; this supposition, however, is refuted by the whole content of Locke's treatment of ideas. The first and third, however, identify the idea with the object of thought. Taken literally this would mean that such physical entities as the earth and the sun were ideas, for surely a man can make them the objects of his thought. It is safe to say that Locke never even considered the hypothesis that such physical entities were ideas, although it is clear enough how his definitions might have suggested the later development. There can be no doubt that had he been aware of the possibility of such a system as that of Berkeley he would have been more circumspect in his fundamental definitions. If we turn to the beginning of Book II, "Of Ideas", we learn that that which a man's "mind is applied about whilst thinking being the ideas that are there, it is past doubt that men have in their minds several ideas—such as those expressed by the words *whiteness, hardness, sweetness, thinking, motion, man, elephant.*"[3] If now we interpret Locke's meaning by these examples, we may conclude that his ideas were universals and that he did not use the word "thinking" in the very broad sense in which it would include sense-perception, but in the narrower sense of discursive consideration or reason-

impossible for him to question the existence of the mind as distinct from a congeries of *sensa* as well as from material things.

[2] *Principles of Human Knowledge*, §5, and the first of the *Dialogues between Hylas and Philonous*.

[3] *Essay* II i.

ing. This list of "ideas" shows clearly enough that he did not have in mind such a case of "thinking" as "perceiving a tree"—which is rightly in the foreground in a discussion of representative perception. His usage was the more common one in which it may be said that when we think we are concerned with universal ideas, which we use either as subjects or predicates. From this list it is clear that he had in mind neither a present cluster of sensations or *sensa* nor what are called images (existent phantasms of the imagination) but rather certain "logical meanings" of general terms.

In the system of Berkeley, the word *idea* is given an extended meaning. The "objects of human knowledge" are either "ideas actually imprinted on the senses" or "ideas formed by the help of memory and imagination" (*Principles*, §1). According to this usage ideas would include sensations or *sensa*. If this were the case then at least some ideas would be psychologically existent entities; and in fact, in Berkeley's system, all ideas might be so described. In the system of Locke, on the contrary, the word *idea* is used far more in the conventional sense, with its Platonic suggestions; *cf.* such phrases as the idea of the soul, of space, of infinity, etc. This usage implies that there is a certain standard or common "conception" which is repeatedly present in the minds of all who are properly said to understand the word and to use it correctly. It is hardly necessary to point out that a recognition of ideas as common meanings in this sense is not incompatible with recognition of such obvious facts as occasional ambiguities, "personal" meanings and historic shifts of meanings. These facts are all to be considered as cases in which there is a plurality of related meanings, each a self-identical universal, connected with a single verbal symbol.

This interpretation of Locke is borne out if we consider the classification of ideas which furnishes the outline of Book II. Simple ideas are divided into four classes: (*a*) those "which come into the mind by one sense only"; (*b*) those which "convey themselves into the mind by more senses than one"; (*c*) those "which are had from reflection only"; and (*d*) those which are "suggested to the mind by all the ways of sensation and reflection, namely, pleasure, pain, power, existence, unity and succession",

It is only the first class of simple ideas which might conceivably be called sensations. But on closer examination we find that this is not what Locke means, since a sensation is a unique "existential" occurrence, while an idea, once acquired (by means of one or more sensations or "reflections") is a lasting possession of the mind which it may use again and again in the description of objects and in the formation of other ideas. Thus we have a sensation of white, but *whiteness* is an unchanging idea quite removed from the flux in which it was "suggested" to us.

There are, furthermore, the three other classes of simple ideas. The second class, those derived from more than one sense, includes space, figure, rest and motion (the primary qualities); the third class, those derived from reflection, includes perception and willing; while the fourth those derived from all sources of sensation and reflection, includes the somewhat mixed group of pleasure, pain, power, existence, unity and succession. There is no plausibility in the supposition that these ideas *are* sensations; their being universals is obvious on the face of them. Locke does not assert that there are any special sensations corresponding to these ideas, nor does he assert that there is nothing in the idea which was not in the sensation (the Humean axiom). In fact there is, in all strictness, nothing in his statements which is incompatible with the doctrine of innate ideas properly understood, for even Plato admitted the necessity of sensory awakeners of thought. Locke's doctrine of simple ideas may be regarded as a recognition of the fact that the process of logical analysis, *i.e.*, of definition, must finally come to an end with certain ideas which are technically indefinable, although in themselves quite clear and obvious in their meaning and containing nothing of the elusive or mysterious. Any attempt to define existence or unity can only result in circularity and yet we must continue to use these ideas knowing quite well what we mean.

Locke's favorite example of an idea of a substance, namely, the "idea of gold", illustrates our theory perfectly, for he never discusses a particular piece of gold existing at some definite time and place, but the nature or essence (whether real or nominal) of gold as such. He points out that our idea of gold is only an arbitrary set of simple ideas, founded upon the experienced concomi-

tance of certain qualities. It is clear that he is not speaking of an existent image in anyone's stream of consciousness (an image which would have a date and such qualities as duration and intensity) but rather of the common or conventional meaning of the word *gold*, which is present to the mind of each person who "understands" the word. His theory of ideas has traditionally been regarded as primarily *psychological* and thus as concerned with the description and classification of certain mental events or psychic experiences. It seems quite obvious, however, that it was *logical* in purpose, although to be sure the seventeenth century was in general oblivious of this distinction. If his *ideas* are not the existential elements which are supposed by some psychologists to compose and constitute consciousness, then the charge of teaching "psychological atomism" and "mental chemistry" cannot be sustained against him.

Let us now note that classification of ideas which furnishes the outline of a large part of Locke's system. There are certain simple or indefinable ideas; these include ideas of existence, power, unity, succession, space, pleasure and pain, as well as the large class of simple ideas corresponding to the various classes of sensory and reflective experience. (There seems to have been no very good reason why Locke should have excluded the idea of *substance* from the class of simple ideas. The reason which he gives is that we have "no clear or distinct idea of that thing which we suppose a support".[4]) All other ideas are complex and are either formed by the mind on the basis of an experienced concomitance of properties or arbitrarily framed without their necessarily having any archetype in nature. These complex ideas are divided into two classes, as they contain or do not contain the supposition of independent existence, that is, into ideas of substances, on the one side, and into ideas of modes and relations, on the other. Modes are either simple or mixed. They are simple if their ideas can be resolved into some one simple idea. Thus the idea of place is simply that of relative position in space and the idea of figure is "nothing but the relation which the parts of the termination of extension or circumscribed space have amongst themselves".[5] In the same

[4] *Essay* II xxiii 4.
[5] *Essay* II xiii 5.

way, the simple modes of number are complex ideas which are derived from repetition of the idea of unity. In the same way, the idea of any given period of time, of a year or of eternity, can be resolved into the simple idea of duration. These forms are modes because figure, number, etc., cannot exist by themselves. Mixed modes are properties of substance of which the ideas do not resolve themselves into any one simple idea; the meaning of the word *drunkenness* involves a variety of simple ideas drawn from the various domains of bodily sensations and visual appearance. What can be more obvious than that modes are universals? For even if we consider only a "particular" triangle, that is, one of a determinate size and shape, an *infima species* of the *genus* triangle, we shall find that it is a universal, since it is capable of an infinite number of appearances in the realm of existence and since, as we may add, it cannot be changed but only replaced by another unchanging universal.

It may possibly be objected that although ideas of modes and relations are universal, Locke's ideas of substance are ideas of individuals. No doubt it is correct to say that *this man* or *this piece of gold* are individuals, but it remains true that the ideas of man or of gold are as universal as ideas can well be. Thus Locke specifically tells us that "the common names of substances, as well as other general terms, stand for sorts; which is nothing else but the being made signs of such complex ideas, wherein several particular substances do or might agree".[8] The essence of each sort is the complex idea which constitutes the definition of that sort. Furthermore, things have essences only so far as they belong to sorts, there being nothing essential to individuals. From these passages we can clearly see that for Locke the ideas of substances are universals, although of course the examples or instances of any such idea are individual substances. Considerations of this character ought to remind us that the problem of substance is not merely the trivial one of a "core", in which properties and relations "inhere", but is connected with the problems of essence and of the fundamental kinds of things in the universe. Thus Locke's belief that there were two general substances known to us, even though we could form no distinct idea of the essence of either

[8] *Essay* III iv 1.

of them, was not merely a meaningless continuation of an older terminology; it was a way of denying that reality could ever be reduced to either "matter" or "mind". On the other hand, his failure to recognize any "substantial form" of gold or lead or of "life" indicated a belief that these were mere seeming differences of substance and were to be explained by differences of "minute constitution". The idea of substance, however "obscure" it may be, plays an essential rôle in his metaphysics.

How can we reconcile the view that Locke's ideas are universals with his outspoken nominalism, or, better, conceptualism, in Book III of the *Essay?* For here he definitely lays down the proposition that "all things that exist are only particulars".[7] "Words become general by being signs of general ideas and ideas become general by separating from them the circumstances of time and space and any other ideas that may determine them to this or that particular existence."[8] "It is plain . . . that general and universal belong not to the real existence of things; but are the inventions and creatures of the understanding, made by it for its own use, and concern only signs, whether words or ideas."[9] "Universality belongs not to things themselves, which are all of them particular in their existence, even those words and ideas which in their signification are general."[10] These statements are so clear and so seemingly unambiguous that they apparently render quite impossible the supposition that Locke had any dealings with universals. If, however, we combine syllogistically the two propositions that *Ideas are universals* and that *No universal is a real thing* the proper conclusion is that *Ideas are not real things.* This conclusion, at first glance, would seem to destroy entirely the validity of all Locke's reasonings, for how could there be a discussion and classification of what does not exist? In the last sentence quoted, however, we note a turn of phrase worthy of comment and which may be the clue to the paradox. Ideas are said to be "particular in their existence" and "general in their signification". An idea, then, has two "aspects", existence and signification or meaning. It is clear that our previous proposition that *Ideas are universals*

[7] III iii 6.
[8] *Ibid.*
[9] *Ibid.*
[10] *Ibid.*

does not concern ideas as things that exist and *have* meanings, but rather ideas *as* meanings. It can hardly be denied that there is an ambiguity in Locke's use of the term *idea,* in that it is occasionally taken to be an existent mental modification but more commonly to be itself a meaning. The idea as that which exists and *has* meaning would be some phantasm of the imagination quite different from the idea which *is* meaning. In fact we can go even further and remark that the difference between these two "ideas" is not merely one of "aspect". For if a man has a house, it would be very strange to say that the house is an aspect of him in the sense in which his size and shape might be two aspects. Locke uses the same word indiscriminately for the possessor and the possessed. It is true, however, that ideas as meanings must be the meanings of something, and that which possesses them as meanings would seem to be either a seen, heard or imagined word or else some fleeting and psychically existent image.

If now, we take ideas to be meanings, then the conclusion of our syllogism, namely, that *ideas are not real things,* ought not to have been either surprising or unwelcome to Locke. For in denying that ideas are real things we do not necessarily assert that they are complete nonentities and unreal in every sense. Reality, in the full meaning of the term, belongs to individual substances and their passing modifications, whether these substances are individual souls or individual portions of matter. Ideas as meanings have at least the secondary and derivative mode of being which consists in their power or possibility of being cogitated by some mind. The passing cogitation would of course possess existence in a more authentic sense. But when we take the word *idea* in its more natural and proper sense, we are referring to universals, to the recurrent subjects and predicates of propositions, and, in this sense, ideas are meanings or "supra-temporal" contents which cannot be said to *exist* at all although to be sure they possess some mode of being. It seems reasonable then to recognize a special mode of being which is proper to ideas (and propositions) and which is described by such phrases as "being only in and for the understanding", or "in or for the mind", or "being a logical construct". This type of being is to be sharply distinguished from the mode of being which is proper to cogitations or sensations. The

differentiating feature which is present in the latter case and not in the former is uniqueness of occurrence, which implies datability.

It follows that Locke's classification of ideas is not so much a chapter in descriptive psychology as an exploration of a non-existential realm by means of which a certain logical classification is established. Ideas are divided into simple and complex and the latter into ideas of substances, of modes and of relations. The very conception of a study of the "stream of consciousness" as such was one which had not yet originated; furthermore, it would have been irrelevant to Locke's fundamentally ontological interest in the *essence* of matter, of mind, of space, of number, etc. Ideas exist "only in the mind" and yet not "in the mind" in the sense of being the constituent elements of the mind's existence. For as mental existences ideas are useless for predication. This may be seen in such an example as the following. Looking into the sky I may say *"That* is a star". The last thing which I might be thought to mean would be that *that* is one of my mental states, a part of my psychic stream. Surely it is the case that I use the idea connected with the words *a star* as a predicate, in itself a universal, by means of which I describe correctly or not some given entity. It is because some have thought that Locke's doctrine that ideas are only in the mind must be interpreted in terms of psychic existence that they have rejected this formula and have insisted that ideas must have a *subsistence* of their own. Now the doctrine of subsistence does not seem to be altogether different from the Lockean theory, since he too believed that ideas have eternal and immutable relations, but the Lockean phrase avoids the perils of hypostatization which are always at hand with a theory of subsistent entities. Locke thought it more important to make clear the fact that ideas are not *forces* or *causes* or *substantial forms* determining the occurrence of events in nature than minutely to specify the type of being which did belong to them.

To understand the real meaning of *ideas* for Locke, we must examine their relation to essences. There is of course but little connection between the essences of Locke and those described so eloquently in the writings of Santayana. This latter writer seems to use the word *essence* with almost the sense of Locke's term *idea,* the chief difference being the doctrine of an eternally sub-

sistent "realm of essence" which is insisted upon by Santayana. The Lockean use of the word essence is far more in accordance with the Aristotelian tradition and with the established usage of the English language. Thus a definition is supposed to state the essence of the class of objects designated by the term defined. The essence of a thing is simply the fundamental and determining nature of it which may be said to make it what it is. Locke never doubted that everything that existed had a "real essence" or "nature", which might or might not be known to man. A large part of the *Essay* is devoted to showing the difference between abstract ideas and the real nature of things. In a significant passage he refers to "what we are told" concerning essences, namely, that they are all "ingenerable and incorruptible". It is evident, he says, "that the doctrine of the immutability of essences proves them to be only abstract ideas".[11] The word "only" indicates the perspective in which he viewed this problem. Abstract ideas possess a lower degree of reality than concrete individuals. The alleged immutability of essences is derived from the fact that philosophers have commonly confused verbal definitions (nominal essences) with the real natures of things. Nominal essences being only "ideas established in the mind with names annexed to them, they are supposed to remain steadily the same, whatever mutations the particular substances are liable to" (*ibid.*). The "idea of a unicorn" is as "certain, steady, and permanent" as that of a horse. If we dwell for a moment upon this example we can easily convince ourselves that Locke did not conceive the "idea of a unicorn" to be a single non-recurrent event in the life of the mind, but rather a repeatable and common possession of all who can be said to know the meaning of the term. On the other hand, the unicorn, being non-existent, has no real essence and is an idea and nothing more.

The doctrine of real essence is thus Locke's substitute for the old doctrine of objective universals. This is in no way contradicted by the fact that he holds that the real essence of substance, whether corporeal or spiritual, is unknown and unknowable. It is rather precisely his criticism of scholasticism that it confused nominal essences (abstract ideas) with real essences and so pretended to ex-

[11] III iii 19.

plain nature from the meanings of words. The nominal essence of gold consists in its conventional definition, namely, in that constellation of properties which, if found in any real object, entitles us to call that real object gold. The real essence of gold, on the contrary, is that which being present in a certain portion of matter *makes* that matter gold, *i.e.*, explains its properties in the same way as the essence of a geometrical figure explains and makes necessary, to intuition and demonstration, properties of the figure. The fundamental vice of scholasticism, as Locke saw it, was in regarding an arbitrary and conventional definition as giving any rational explanation of the observable properties of the substance in question. Such an explanation, is, of course, circular and may be illustrated by the familiar example of those who would explain the operation of a clock by the statement that it is the nature of a clock to tell time. Locke was convinced that the real explanation of material substances, including both the chemical elements and the biological species, lay in the direction of the "minute constitution" of these substances. The real essence of gold would be, in modern terms, the ultimate arrangement of protons and electrons which would explain why gold had such and such chemical and physical properties. One may take exception to his doctrine that the real essence, in this sense, of the chemical elements will never be known, for apparently such an hypothesis as the Bohr theory of the atom brings us appreciably nearer to the goal which he had in mind. From the point of view of modern science it would seem that the real essence of gold or of any other empirically given substance can be progressively approached through a series of hypotheses and that as the ideal, but unattainable, limit of this process, there would be perfect knowledge of the real essence of the substance in question. This view is not, strictly speaking, in contradiction with the teaching of Locke, for such a scientific hypothesis, however well founded and practically certain it might be, would still lack the character of absolute certainty, which Locke believed to be essential to knowledge.[12]

[12] The following criticism might be made of Locke with a view to showing that, on his own admissions, we do have a real but imperfect knowledge of the "real essence" of substances:

1) We have at least a partial knowledge of the real essence of matter,

We are now in a position to understand the significance of Locke's conceptualism. He wished to deny that the study of ideas, that is, conventional word-meanings, could advance the understanding of nature. Ideas are merely in the understanding and are not the constitutive forces which govern the world of things. Thus the idea of man, his conventional definition, is by no means what constitutes a man. True, in the case of modes, whether simple or mixed, there is a thorough-going coincidence of real and nominal essence. Thus a triangle is what we define it to be, and the same may be said of such a "mixed mode" as *courage*. These ideas are their own archetypes and are mere creations of the understanding. But when we deal with an existent substance we may define it as we will without affecting to any degree its real essence. Thus the properties of gold must be learned from experience and the hidden essence which is the source of these properties can only be surmised. The nominal essence of gold is the same as the complex idea of that particular substance, but its real essence exists not in our minds, but in gold, making it what it is. The real essence of a substance never exists apart from that of which it is the essence, while a mere idea exists only in our minds as a meaning. It is this fundamental ontological distinction which Locke never tires of driving home and which is the true sense of his conceptualism.

Locke's system, then, in agreement with common opinion, denies any absolute or independent existence of ideas. Their secondary and dependent ontological status does not preclude them from possessing and exercising a supreme epistemological function. Locke commences his account of knowledge with the proposition that, since the mind "hath no other immediate object but its own ideas", our knowledge is "only conversant about them". Knowledge is defined as "perception of the connection and agreement or disagreement and repugnancy of any of our ideas".[13] These

in that we know (according to Locke) that matter must be extended and solid. These are not merely identifying characteristics but fundamental determining qualities which make this universal substance what it is.

2) We do in fact have some knowledge of the real essence of gold, since we know that its real essence consists in *some* configuration of its minute parts, although we do not know which.

[13] IV i 1-2.

propositions seem at first glance to commit him to an extreme subjective idealism or even solipsism and were no doubt historically influential in originating the idealistic system in the mind of Berkeley. At the same time, it is clear that they suggested no such conclusion to Locke himself. In the first place, ideas are the *immediate* objects of the mind, but not necessarily the ultimate objects. He would not have even thought of saying that stones and trees and his own body were only ideas; these physical entities were nevertheless known by means of ideas. In the second place, the proposition that knowledge is the perception of the agreement or disagreement of ideas is demonstrably little more than the traditional doctrine that knowledge is a matter of propositions which involve a subject and a predicate and which are either affirmative or negative. It might well be objected to his definition that knowledge is concerned not with ideas but with things. It is nevertheless true that things are in the mind only in so far as they are represented by ideas. Thus the proposition, God is, while properly concerned not with the idea of God, but with God, may be regarded as expressing the fitness or appropriateness of the ideas of God and of existence to each other. The proposition does not assert the appropriateness of God and existence, as if it were proper for God to exist, but the agreement of the ideas with each other; that is, the appropriateness of joining them in an affirmative proposition. It is not to be denied, however, that the appropriateness of joining ideas in affirmative propositions rests upon the prior union of the objects of the ideas. Thus it is appropriate to join the two ideas used in our example only if in fact God does exist. A second and perhaps more damaging criticism is that Locke's definition, like all attempted definitions of ultimate terms, is circular, since perception, which is included in the definition, would seem to be a species of the term defined, namely, knowledge. Thus if we can understand the phrase "*perception* of the agreement and disagreement of ideas" it is because we already know what at least one species of knowledge is. While it thus appears that Locke's definition of knowledge is defective, it nevertheless has its value as a characterization of knowledge. We may agree with him that knowledge does involve ideas (universals)

and yet regret that he failed to bring out clearly the important fact that knowledge is not (commonly) about ideas but rather about things and their properties and relations.

Knowledge for Locke consists of knowledge either of universal relations, founded upon the comparison of our own ideas, or of the existence of a small number of particulars. Thus we have an intuitive knowledge of our own existence, a demonstrative knowledge of the existence of God and a sensitive knowledge of such few material things as we are perceiving at the moment. Leaving aside the first two instances of such knowledge, we may pause for a moment with the third. It may be said that Locke disposes too hastily of the problem of the "existence of an external world". His discussion of the matter is chiefly confined to the eleventh chapter of Book IV. In the first place, "nobody can in earnest be so skeptical as to be uncertain of the existence of those things which he sees and feels". Thus the question is a vain and useless one, since we are committed by a necessity of our nature to a belief in external things. If nevertheless we seriously consider this skepticism it may be answered by various arguments. The more considerable of the proofs which Locke cites may be condensed into the statements that, first, *there must be a cause of our sensations,* and, secondly, *our sensations bear witness to the truth of each other's reports.*

Let it be granted that there is a real world of bodies. The question remains whether Locke was entitled to claim to know either of the existence or of the nature of these bodies on the basis of his theory of ideas. Does not his theory involve the mind in a self-contained solipsism in which the mind's *objects* can only be its own *ideas?* In short, is knowledge of a really existent independent universe of things compatible with his premises?

There can be no doubt that Locke's confusing definitions of ideas and of knowledge do strongly suggest a solipsistic position. It is certain that a realistic philosophy demands knowledge of entities which are not ideas and certain likewise that Locke believed such knowledge to exist. The solution of the paradox lies in the fact that he failed to distinguish adequately between *ideas* and *objects.* Thus in a passage which has often been commented upon

he speaks as if an idea of a dozen were a dozen ideas.[14] It would have been far more in accordance with what he meant had he defined knowledge as the perception of the agreement or disagreement of certain *objects*, including under this term properties and relations as well as things. In spite of this fundamental inadequacy in his terminology, his insight that knowledge is a matter of ideas, as universal subjects or predicates, does not seem to be incompatible with realism.

If a rehabilitation of the Lockean philosophy were to be attempted it would be necessary to come to terms with Berkeley's arguments concerning the relativity of sensible appearances and the inseparability of primary and secondary qualities as well as with many other difficulties. Without attempting so large a task, we can throw an interesting light on Locke's system by means of a comparison with that of Berkeley. It has often been remarked that Berkeley, at least, did not deny the existence of a transcendent cause of our sensations. The difference then is rather in the theory of the nature of this cause. Berkeley's system is, like that of Leibniz, one of spiritual realism. What truly exists consists of spiritual substances which are, at the same time, the only efficacious causes. These spiritual substances are apprehended by means of "notional" thought, that is, by means of an exertion of the mind rather than by the passivity of sensation. It may now be pointed out that it is implied in Locke's system, likewise, that reality is apprehended by means of the "intellect". In short, the follower of Locke may admit that the sensible sizes and shapes of bodies are as relative and mental as are the secondary qualities. He may persist in the view, however, that real bodies exist which have real sizes and shapes which are not relative, at least in the way that secondary qualities are relative. These real sizes and shapes are those established by measurement, just as the real properties of bodies in general are those established by scientific method. It is of course incontestable that both measurement and scientific method use sense-perception. It is nevertheless true that that which is known by means of measurement and scientific method, *i.e.*, the real body with its properties, is not something directly sensed, but

[14] II xvi 2.

something *inferred*, that is, *thought*. Just as in the sphere of ethical theory the truly good is not merely what is desired but rather what seems to be desirable on reflection, that is, in a summing-up of the results of past experience, so the real world is that which maintains itself in reflection. In fact, this is true even in the realm of naïve realism, since the color which we ascribe to an object as its real, "public" and "common" color, its "color for all", is not merely sensed but ascribed to the object by means of an habitual and unconscious inference. Thus the ascribed color may be white, while the actually sensed color may be pink if we happen to be looking at the object through rose-colored spectacles. The fact, however, that there are, in our customary way of looking at things, "common" and "public" colors as well as privately sensed colors, does not destroy the significance of the Lockean distinction between primary and secondary qualities.

The validity of this distinction would seem to be essential to any system of physical realism. In spite of the criticisms made of it by Berkeley and Hume as well as by the new realists, the doctrine is firmly entrenched in the traditions of modern science. It may be defended on the grounds that the reality of the minute configuration, conceived in terms of primary qualities, does offer at least a partial explanation of our sensations; on the other hand the objectivity of a secondary quality contributes *nothing* to the explanation of our experiences. The primary qualities which are the cause of the secondary may be illustrated by the minute indentations within the groove of a phonograph record, while the secondary qualities are illustrated by the music which we hear when the record is played. It would obviously be quite superfluous to assume that the music is somehow in the record whether it is played or not. In the same way, red or any other color is to be explained, in a manner to be more exactly determined by the physicist, either by the "minute constitution" of the surface which appears to be red or by certain imperceptible electrical disturbances taking place there. Let us grant that this sort of explanation can never be complete and that the psychophysical gap will always remain; it nevertheless remains true that the physical theory of the minute constitution of bodies does contribute something to the explanation of our sensations. On the other hand, the assump-

tion of secondary (or tertiary) qualities intrinsic to physical things is a vain and superfluous hypothesis, since the occurrence of our sensations is as well explained without this assumption. Furthermore, the oft-repeated argument that primary and secondary qualities are imaginatively inseparable may be neglected, since it makes imagination the test of possibility. We may say that the physicist simply abstracts from or leaves aside the sensuous qualities and that there is nothing in the nature of the human mind which prevents or forbids such an abstractive procedure. In any case, it is still correct to say, as Locke did say, that in the case of the primary qualities, although not in that of the secondary qualities, there is a *resemblance* between the real quality in bodies and the appearance (or idea) of it in our minds. This statement is quite compatible with recognition of the fact which Berkeley pointed out that the sensible appearances (chiefly visual) of the primary qualities are as relative and subjective as are the secondary qualities themselves.

It may well be objected that such a doctrine of physical realism inevitably implies a dualism between the realm of consciousness and that of bodies, which in turn plunges us into insoluble difficulties. We only escape the problem of solipsism to become entangled in metaphysical difficulties of the relation of mind and body. The physical realist may reply however that he does not attempt to furnish a complete and ultimate solution of the problems of metaphysics (a thing which is really quite beyond our power), but rather to set forth a platform or philosophical attitude which is compatible with the demands of daily life and natural science. It is no doubt impossible fully to understand the relations of mind and body (or anything else). Even so there is nothing to prevent us from recording the empirically attested facts of that relation. It may well be said that such a dualism as that which Locke implies is the best attainable arrangement and classification of the facts of inner and outer observation, without denying that as a matter of ultimate metaphysics the truth lies in the direction of a one-substance theory, whether materialism, spiritualism or some doctrine of a neutral stuff.

In any case it is clear that a rehabilitation of Locke's theory of knowledge would have to insist upon certain distinctions which he

neglects. One would have to distinguish sharply between the occurrence of a sensation, the judgment or belief that the sensation exists (in the mind), and the judgment or belief that a cause of the sensation exists in the external world. Mere sensing as such does not constitute knowledge of any sort, but the perception of the existence of a sensation or of a material thing, unconsciously inferred from the sensation, is true knowledge and is the basis of all our knowledge of existence. One would have to make it part of such a system, as the Critical Realists have made clear, that the physical thing is essentially transcendent to consciousness. It is never directly sensed or intuited but always posited as the most probable cause of our sensations. The object is *aimed at* or *referred to* without literally entering the mind. Furthermore, my certainty that some physical cause of a sensation exists does not imply that this cause has any determinate degree of resemblance to the sensation or to the object as naïvely and conventionally perceived. The occurrence of a sensation enables me to infer the existence of an external cause, but does not determine the *what* or nature of that cause. External reality is apprehended by means of such concepts as those of substance and cause, space and time, number, unity and existence. No doubt Locke would insist that these concepts are all derived from sensation or reflection. This thesis, taken in an extreme and literal sense, may be regarded as having been reduced to absurdity by David Hume, who attempted to deny the existence of these ideas on the ground that no corresponding impressions existed. But Locke's meaning was merely the obvious one that all such ideas are "suggested" to the mind by its sensuous experiences. May we not say, with Kant, that such categories are implicit in our experience from the beginning and can only be extricated by a process of intellectual analysis? In any case the issue here suggested appears to be only a psychological one not at all important for the theory of knowledge. The simple fact suffices that we somehow have or possess the ideas in question and that they and their objects are totally different from sensations. The apprehension of reality in modern physical theory, whether in the theory of relativity or quanta or wave-mechanics, appears to be overwhelmingly a matter of "abstract ideas" or intellectual categories. The real world is believed to have little or no re-

semblance either to sensations or to the objects of naïve perception and belief. If one were to attempt a re-statement of the Lockean philosophy it would have to be in such terms as to involve no conflict with modern physics, which seems to be everywhere striving towards views at variance with "common sense". The world of things would have to be recognized as a provisional construction and the problem of the detailed nature of physical reality handed over to the mathematical physicist to be solved as best he can.

If now we revert to the question whether Locke's theory of ideas is compatible with realism, we may point out that the chief difficulty has been that ideas have been regarded as existent phantasms produced by unknown and unknowable causes. If however ideas are universals we may use them as adjectives to describe either directly or indirectly the "unknown" causes. No doubt our knowledge of physical nature will always remain inadequate and merely relative, as Locke pointed out. We know it fundamentally as that which produces such and such sensations. Nevertheless, even in describing it as a cause or in conceiving it, however vaguely, as matter deployed in space, we claim to possess knowledge of some substance transcendent to our own mental lives. And of course in our unwavering faith in the existence of other minds and in our own past experiences we have a further instance of knowledge of what is transcendent. Were we mere streams of "impressions and ideas" in the Humean sense self-transcendence would indeed be impossible. Nevertheless it seems to be a fact that our general cognitive situation is best described as that of beings who cannot avoid believing in things and describing them by means of certain "floating adjectives" which are themselves not properly either mental or material. There is, furthermore, no proof that all our descriptions of things are or must be false, and, lastly, we all do claim to possess some true knowledge of things, if only as the otherwise unknown causes of our sensations.

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A CONTROVERSY IN THE LOGIC OF MATHEMATICS*

THE impetus of the attack on Cantor's theory of transfinites carried assailants and defenders into an examination of the foundations of mathematics, and thence into a questioning of logic as a substructure for mathematics. Is logic basic, as Frege and Peano assumed, and are its laws final? Brouwer has answered this question with a flat no. Scorning any grounding of mathematics in logic, he has given primacy to mathematical intuition and forced logic to play second fiddle. This divergence of view among workers in foundations of mathematics will constitute the subject-matter of the present discussion.

The issue between Brouwer's intuitionist school and its opponents was sharply defined with the declaration by the latter of the unlimited validity of the law of excluded middle while the former protested an *ignorabimus* with reference to it. The considerations which governed the stand taken were certain conceptions of the nature of mathematics and of the relation of logic to it. Now on this point a threefold rather than twofold cleavage came to pass, each camp proclaiming its own remedy for the mathematical difficulty. Two of the three schools agree on the legitimacy of the processes at issue: unrestricted definition of the questionable entities, *e.g.*, of the set of all real numbers, and the extension of the law of excluded middle to reasoning on infinite sets. But these same schools have different answers to Brouwer's criticisms. At least I judge that the formalist school of Hilbert and the logistic school of Frege, Peano, Couturat, Ramsey, Whitehead, and Russell, while destined by intellectualistic temper to make common cause against Brouwer, would find different reasons for doing so. Whitehead and Russell, the most important living representatives of the logistic school, have not entered the arena of this particular controversy, but their work in *Principia Mathematica* speaks for itself. That they would join ranks with Hilbert on the mathematical issue as to the universal validity of the law of excluded middle, against the intuitionist school of Brouwer and Weyl, is a foregone conclusion.

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It is my belief, however, that the grounds for their decision would consist in an account of mathematics and logic more satisfying to mathematicians in general than Hilbert's.

All of Russell's work in logic and the philosophy of mathematics is permeated with the assurance that logical foundations for mathematics can be laid down and that no arbitrary line between logic and mathematics can be drawn. Where, he asks, in the formal deduction from premises can it be said that mathematics begins and logic ends? "The fact that all mathematics is symbolic logic is one of the greatest discoveries of our age; and when this fact has been established, the remainder of the principles of mathematics consists in the analysis of symbolic logic itself".[1] Objections have been made to this position; but these express in the main that Russell asserted too flatly the identity of mathematics and symbolic logic when he should have asserted merely the possibility of deriving mathematics without break from general propositions of logic. Up to the introduction of certain unproved principles, we can say that at no definite point does the symbolic development become mathematical, though at the extremes of the system a distinction can be observed.

But now with logic defined as the logisticians define it—as a system of tautologies—the introduction and use of three logically unproved mathematical principles do mean that mathematics there ceases being a branch of logic. The axiom of infinity, the multiplicative axiom, and the axiom of reducibility, which are rather significantly the focus of the intuitionist attack, seem to lack the tautologous character of logical propositions. Until the appearance of these axioms, mathematics is a part of logic; their addition marks the introduction of statements of fact. Ramsey, by carrying the extensional viewpoint of logic to extremes, seemingly reduces the first two axioms to tautologies, but the axiom of reducibility still persists as a blemish in the tautologous structure. Whether mathematicians would grant that the subject of their discourse and livelihood was, like logic, a system of tautologies, I cannot say. I should hazard that any objection made would be on a par with the usual one made against the syllogism—where the fact that

[1] Bertrand Russell, *Principles of Mathematics* (Cambridge, England, 1903) 5.

"there is no new knowledge in the conclusion" is misunderstood to mean that nothing psychologically surprising ever emerges.

Other objections to the merging of mathematics and logic might be and have been made, but none evince a complete lack of sympathy with Whitehead and Russell's attempt. Such objections all pale before the radical criticism of the whole logistic impulse as "an algebraical scholasticism as sterile as the scholasticism of the middle ages".[2] The primacy of logic, according to the intuitionist school, means the reduction of mathematics to pure formalism, and is in Weyl's opinion a denial to mind of its "old and sacred rights".[3] "Symbolic logic, like poetic art . . . simply celebrates the victory or records the defeat."[4] Brouwer is openly hostile to any attempt at building up mathematics logically from a set of postulates, and he has reversed the roles laid down for mathematics and logistics by the authors of *Principia*, in accord with his convictions about the nature of mathematical thinking. For him, the ideal notions constructed from the mathematical intuition find but a halting translation into symbolic discourse. "The mathematical fact is independent of the logical or algebraic vestment under which we try to represent it; in fact, the idea we have of it is fuller and richer than any . . . combination of signs or of propositions by which we can express it. The expression of a mathematical fact is arbitrary, conventional, but the fact itself, that is, the truth which it contains, forces itself on our minds apart from any convention."[5] Logistic is merely a mathematical language shadowing the episodes in the world of mathematical thought, but never granted access to that world. Essentially detached from the truth it accompanies, it fizzles out in verbal paradoxes once its jurisdiction is illegitimately extended. Logical principles such as the law of contradiction and the law of identity are by no means a guide to the establishment of (wordless) mathematical relations; they represent merely an observed regularity in the

[2] M. Winter, "On the Logical Introduction to the Theory of Functions", tr. by Fred Rothwell. *The Monist*, XXXI (1921) 459.

[3] Hermann Weyl, "Consistency in Mathematics", *Rice Institute Pamphlet*, XVI 245.

[4] Léon Brunschvicg, *Les étapes de la philosophie mathématique* (Paris, 1912) 426.

[5] Pierre Boutroux, *L'idéal scientifique des mathématiciens* (Paris, 1920) 203.

language about such establishment. For example, the significant thing about a mathematical contradiction is not for Brouwer the exemplification of the logical law of contradiction, which asserts the impossibility that $a \neq a$. It is rather, the fact that the mathematical construction has broken down.

If, according to Brouwer, logistics in concerning itself with mathematical language does not clarify mathematics, and in truth can only lag behind, inadequate to the understanding of mathematical fact, then it must acquiesce in the restriction prescribed by the mathematical intuition. This latter will secure the elimination of those paradoxes, cited with exultation by Brouwer's school, such as Russell's "class of all classes" and Epimenides the Cretan. For intuition will limit the systems dealt with to those constructible on the basis of it. This intuition is the sense of a temporal unity in diversity, of a unit span of time in which inexhaustible division is possible. And this is the basic set-up for any system: The intuition of two-oneness gives rise to the numbers one and two from which all finite ordinal numbers may be constructed and whose indefinite repetition creates the smallest infinite ordinal ω. Further, the sense of the discrete and the continuous, both within the temporal span, gives rise to the intuition of the linear continuum. Evidently Brouwer's view retrieves for Kant the apriority of time even though discarding the apriority of space.

Now this fundamental intuition is not to be construed as one of the primitives of some postulational system. It is "something in terms of which all undefined ideas of mathematical systems are to be intuitively conceived. . . . Once recognize the fundamental intuition and the way is left open for constructing various postulational systems."[6] The attempt to make logic primary constitutes a vicious circle according to Brouwer, since logic itself, concerned as it is with the relations of whole and part, requires the basal intuition of mathematics.

The formalist school of Hilbert is agreed that mathematics is not derivable from logical principles alone, and his "metamathematics", or theory of proof, agrees with the finitism entailed in the intuitionist mathematics. According to Hilbert, mathematics has a content independent of logic, a system of extra-logical con-

[6] Arnold Dresden, "Brouwer's Contributions to the Foundations of Mathematics", *Bull. Amer. Math. Soc.* XXX (1924) 33.

crete objects on which intuition falls—but which in themselves are meaningless. These perceptible objects are symbols or "signs", but are purged of all intuitive content so as not to be identifiable with the intuitively grasped natural numbers of Brouwer. Thus the likeness of the two types of intuition is little more than a likeness in name. Mathematics for Hilbert is a language, even something less than a language; each sign, all mathematical axioms and logical principles, the "elementary deduction" (material implication)—all are rid as far as possible of any meaning. Only the discussion of how this meaningless subject-matter is to be manipulated, *i.e.*, only the "metamathematics", which concerns itself with the possibility of certain combinations of signs and the demonstrability of certain theorems about the signs, has meaning. That mathematics falls to the level of chess is perhaps more distasteful to intuitionists than Whitehead and Russell's logical derivation of mathematics, in which directly understood meanings of mathematical theorems and primitive notions are not expressly dismissed. Most mathematicians are wroth, rather justifiably so I think, at the suggestion that mathematics has no content and that proofs of the impossibility of certain combinations or of the indemonstrability of certain theorems are a sort of meta-chess. Between wordless thought and thoughtless words, the decision would possibly rest with the former.

But I should add that Hilbert's motive for giving this description of mathematics is defense, against Brouwer, of his use of debatable notions. He does it to show his procedure consistent. As a matter of fact, in the actual mathematical development, the subject-matter is not meaningless for Hilbert. And there is never any doubt in the mind of the great mathematician that the game is the most valuable one that could be played and that the metamathematics is not much ado about nothing.

It is in defending his position, then, that Hilbert takes the methodological precaution of reducing all notions to meaningless sign-complexes. This provides the condition of demonstrating his position consistent: identity throughout deductions undefiled by richness of meaning. Of course he realizes the impossibility of abstracting from all intuition. Recognition of the same sign in different deductive patterns must be possible, and one meaning must

be agreed on for "the first sign of a given sort met in an ordered series" and for the sign of contradiction. With this minimum, Hilbert requires, first, the formulation of a system of axioms sufficient to generate all mathematics, and, second, the proof that these are consistent.[7] Up to the introduction of non-tautologous principles, *Principia* fulfills the first requirement. Proof that a proposition of the form "A is non-A" can never be deduced, *Principia* does not attempt. And such a proof of consistency Hilbert is bound to provide. Obviously there can be no question of the truth or falsity of meaningless sign-complexes, but proof of at least consistency can be demanded.

Now despite Hilbert's intellectualistic temper, common to the logisticians, he and the intuitionists have important points of agreement. Brouwer confines the use of classical processes of mathematics to finite or denumerable sets of objects. Evidently the basal intuition cannot give rise to numbers not constructible by repeating a finite number of times the operation of creating a finite ordinal number or the infinite ordinal number ω. Now Hilbert discourses of entities unacceptable to the intuitionist—non-denumerable infinites—but he refuses to the infinite any place in reality. Theorems about infinites, *e.g.*, "There are infinitely many primes", he calls "ideal propositions". Such finitism appears again in the consistency-proofs of his metamathematics just as it appears in Brouwer's mathematics. The metamathematical reflection upon a given deductive pattern containing only a finite number of signs employs but a finite number of steps in its proofs. That it should itself be free from contradiction seems very little to ask. Further, "he does not seek to demonstrate that [mathematical] deductions, should they be infinite in number, would all be exempt from contradiction. Man is capable of only a finite number of actual deductions; [hence] if he meets a contradiction, it is after a finite number of operations. And if one establishes that this circumstance cannot occur, the problem will be humanly solved."[8]

With this avowal of finitism one wonders what quarrel Brouwer could have. A quarrel still exists, and it grows out of his dissatis-

[7] Von Neumann's interpretation. See G. H. Hardy, "Mathematical Proof", *Mind* n.s. XXXVIII (1929) 14.

[8] Rolin Wavre, "Y a-t-il une crise des mathématiques?", *Revue de Métaphysique et de Morale* XXXI (1924) 461.

faction with mere consistency for mathematics and his demand for truth. Granted that Hilbert's axiomatic treatment of arithmetic is proved free from contradiction, "nothing of mathematical value will be attained in this manner; a false theory which is not halted by a contradiction is none the less false, just as a criminal policy unhindered by a reprimanding court is none the less criminal."[9] Whereas Hilbert is willing to admit a proposition not leading to contradiction into the body of mathematics and to assume the existence it affirms, Brouwer holds that simple non-contradictoriness is insufficient justification for any proposition and that only actual exhibition of the entity whose existence is postulated can warrant assumption of existence and guarantee truth. The formalist has no right, he says, to proceed as though existence had been proved merely on the basis of the non-contradictoriness of the existential proposition; nor is the existence of an invalidating entity implied in the contradictoriness of a proposition. Propositions asserting ideal existence must be converted into their cash value. "There exists an element having the attribute A", requiring perhaps an infinite process of logical addition to test its truth, has no truth until converted into the judgment, "This element has the attribute A". All the axioms of the formalists have definite meaning only so long as confined to the domain of finite sets; but 'ideal' propositions concerning all the members of such sets as have the cardinal number $2^{\aleph_0}$ are meaningless to the intuitionist. Hilbert and the logisticians accept assertions of the possible existence of such entities because these have not run them into contradiction in the main body of analysis. The intuitionist considers such acceptance as placing too much faith in the credit system.

I now wish to present the strictly mathematical issue, apart from its philosophic ramifications. This is perfectly definite, and on any other view than Brouwer's, can be divorced from epistemological considerations. Much of the antagonism to Brouwer's position, at least on the part of philosophers, springs from his insistence on a doubtful epistemology as an integral part of his view. But here, as in physics, philosophic considerations can for

[9] L. E. J. Brouwer, "Ueber die Bedeutung des Satzes vom ausgeschlossen Dritten", *Journal für Mathematik* CLIV (Sept., 1924) 3.

the most part be ignored. There has been much cry among philosophers that the foundations of science are rocking. But until a new physical concept requires changes in the type of mathematics used, physics will keep its *status quo*. That is, the merely philosophic implications of a concept can be ignored so far as the development of the science is concerned. Physicists will no doubt continue to do what philosophers suppose is muddling along on shaky foundations, with the usual amount of muddle and rigor.

The mathematical issue arises in the quest for certainty. And the Brouwerites have assured themselves of the most secure position by laying down restrictions safeguarding themselves from risk. Russell says, "classes which are infinite are given all at once by the defining property of their members, so that there is no question of 'completion' or of 'successive synthesis' ".[10] It is just this unquestionability which the intuitionist questions. The issue in fact rests on whether one can meaningfully define sets whose elements cannot be individually exhibited. That is to say, the validity of Zermelo's axiom of inclusion, which defines a subset by means of a property uniting the elements possessing it, is here at stake. Is a definition by inclusion equivalent to a definition by extension? The intuitionist answers no. His restriction is that definitions must contain the means of constructing the object defined. It is impossible to give a constructive definition, for example, of the set whose elements are the points of space, a set whose cardinal number is $2^{\aleph_0}$. For constructibility means essentially one-by-one exhibition. Existence in an infinite set is not a well-defined attribute, for an infinite process of logical addition may be requisite to call the indefinite element into being.

This insistence of the intuitionist-finitist represents a further elaboration of the heritage of Kronecker, a heritage of distrust of infinite processes and of trust in the basic nature of the series of natural numbers. In terms of this series the notions "finite" and "infinite" can be defined. According to the finitists, an infinite sequence is one which can be put in 1-1 correspondence with the base series of integers. Its definition is not in terms of the categories of whole and part, *i.e.*, an infinite sequence is not defined

[10] *Our Knowledge of the External World as a Field for Scientific Method in Philosophy* (Chicago, 1915) 156.

as one which can be put in 1-1 correspondence with a proper part of itself. This latter, the usual definition of an infinite sequence, represents to the finitist an error resultant from extending to infinite sets the categories of whole and part, which really apply only to finite sets.

The question now arises what definition the finitists can give to the continuum, an aggregate not to be correlated with the natural numbers. Evidently its definition as the aggregate of all real numbers, a given anterior to its elements and related to them as whole to part, is foredoomed. It is a basic tenet of the finitists that the relation of whole and part, of a class to its elements, is exemplified only by finite collections. And what, they ask, can *existence* of an aggregate of all real numbers mean? There is no law for its construction as there is for the series of integers —or as there is for any given real number. The latter may be defined by a law of generation of a decimal expansion. But the continuum cannot be defined as a law of generation of these laws. Such a law would produce a denumerable and rather mutilated continuum. Rolin Wavre, while not following Brouwer in every respect, interprets in essentials the intuitionist conception of the continuum as a series of arbitrary choices of decimal expansions.[11] The continuum is a "Medium freien Werdens".[12] No law will determine what each choice shall be, and nothing limits the freedom of those choices. Evidently the numbers are not all given, and the continuum is an endless becoming. We are to rest satisfied with the exhibition of particular numbers by some law. A given real number, as $\sqrt{3}$, will be in the continuum in the sense that the decimal expansion can be made to conform to a law, here the law for the extraction of the square root. The ultimate elements of this type of continuum will be the interval instead of the point, since only a finite number of figures of the expansion can confront one; and each interval will be the locus of a new becoming.

I have indicated now the bearing of a restricted right of definition on such propositions as Zermelo's axiom of inclusion and on the definition of the continuum. The crux of the issue is such terms

[11] For discussion of this conception of the continuum, see Rolin Wavre, "Y a-t-il une crise des mathématiques?", *Rev. de Mét. et de Mor.* XXXI 451-456.

[12] Quotation from Brouwer by Wavre, *Ibid.* 453 n.

as "all" and "there exists." The multiplicative axiom, stating that in a class with an infinite number of sub-classes there exists a class containing one element from each of those sub-classes, and the axiom of infinity, asserting the existence of an infinite number of individuals, are additional principles become suspect to intuition. The right to reason on infinite sets, questioned in connection with these axioms of mathematics, is again questioned from another perspective, that of logic. It is the consequence for logic of the intuitionist conception of "all" and "there exists" which has fanned the flames of controversy. The controversy centers about a second restriction, which the intuitionist imposes on the applicability of the law of excluded middle. The formalist holds that the propositions, "All elements of the set have the attribute A" and "There exists an element of the set having the attribute non-A", are contradictories for which the law of excluded middle holds regardless of the set's finitude, or infinitude. Granted the falsity of one proposition, the truth of the other follows. Proof of the contradictoriness of the universal proposition would *ipso facto* prove the truth of the singular, *i.e.*, the existence of an object having the attribute non-A. "Not all" is thus made equivalent to "there exists", whether or not an infinite logical sum is entailed in the object's discovery. The intuitionist holds that if the universal affirmative cannot be shown true, and yet if no element contradicting it can be constructed, then the propositions must be consigned to a third position of being neither true nor false, but indemonstrable. And the indemonstrable has a place in reality; it is not something which is at present unknown to be either true or false but something which one hopes eventually to prove so. Admission of this third alternative is not a sop to the finitude of man's intellect. It is a comment on the infinitude of time.

This is no denial of the applicability of the law of excluded middle to contradictory propositions about finite collections. Traditional logic and intuitionism are here in perfect accord. The intuitionist's thesis is that the field of this law's application must be limited to such collections, inasmuch as we cannot say whether or not it is applicable beyond. Such at least is the way of discretion. It is not to be understood that Brouwer flatly denies the validity of the law of excluded middle where infinite sets are con-

cerned; about this matter he claims ignorance. "It is not certain whether or not all logic is permissible, and not certain whether it can be decided whether or not all logic is permissible."[13]

If Brouwer ever felt it incumbent on him to formulate his logical principles, these would, according to Wavre,[14] range themselves against the traditional logic in the following fashion:

> Formalist: A proposition must be either true or false.
> Intuitionist: No corresponding principle, *e.g.*, that a proposition is either true (demonstrable) or contradictory, is admissible.
> Formalist: The falsity of the falsity of a proposition implies its truth.
> Intuitionist: Only the principle that the truth of a proposition implies the contradictory of its contradictory is admissible, not the converse.

Demonstration then of the truth of a proposition by proving its contradictory a contradiction falls down as a general rule of procedure, holding only for the special case of finite sets. And the only perfectly clear implication holding between a universal affirmative proposition *a* and its formally contradictory singular *b* is "*b* implies non-*a*", and *b* has been demonstrated.

The consequences of attempting to operate with only two of the Aristotelian canons, the laws of contradiction and identity, appear in the following examples, from Wavre,[15] illustrating Brouwer's attitude: Given two functions of integers, $m = \varphi(n)$ and $m' = \varphi'(n)$, defining two points, can we assert that they must either be identical or distinct? We shall say that the origin of a coördinate plane, which is densely covered with points, is taken as the center of a sequence of concentric circles with decreasing radii. Can we assert that a given point is either interior to all the circles, *i.e.*, identical with the point at the origin, or exterior to one of them? The intuitionist answers no, for the process defining the two points to be identical implies an infinity of operations which cannot be thought in its totality, and the discovery of their distinctness likewise entails, *a priori*, an infinite process. The formalist affirms the validity of the alternative, "either identical or distinct", and ignores the generation of such

[13] L. E. J. Brouwer. Quoted by Arnold Dresden in "Brouwer's Contributions to the Foundations of Mathematics", *Bull. Amer. Math. Soc.* XXX 40.
[14] Rolin Wavre, "Logique formelle et logique empiriste", *Rev. de Mét. et de Mor.* XXXIII (1926) 70.
[15] Rolin Wavre, "Y a-t-il une crise des mathématiques?", *Rev. de Mét. et de Mor.* XXXI 455, 448.

points—the exhaustion of an infinite sequence defining "the point interior to all circles".

The problem of determining the points, or functions defining them, to be identical or different may also be viewed from another angle.[16] Their identity may be proved by reducing one function to the other. The proof of their difference entails the discovery of a number n giving rise to two distinct numbers m and m'. Consideration of what such a discovery requires in the way of exhaustive exhibition of the number-series deters the intuitionist from assuming that the rejection of their identity necessarily implies their difference. This is devastating to the present set-up of analysis. The ordinary proof of identity of two functions consists in showing them not different. What sort of proof of identity the intuitionist would substitute here—and some proof is needful—I do not know. Another instance of the intuitionist's objection to an *a priori* exclusion of a *tertium* concerns the alternative, "either algebraic or transcendental". If no construction can be given to establish a number transcendental, and if no equation with rational coefficients can be found of which it is the root, *i.e.*, proving it algebraic, then the assumption that it must be one or the other is bankrupt of meaning.

Brouwer has the stronger position in running the lesser risks. But he cannot convince the formalists that their procedure according to the rules of classical logic is illegitimate, inasmuch as he cannot in the nature of the case put his finger on a *tertium*. And evidently we cannot down Brouwer by demanding that he exhibit a number which is neither algebraic nor transcendental, for then a modified form of the law of excluded middle could be put in force between three alternatives. The advantage of the formalist position is in part one of inertia and in part one of conservative opposition to changes in the large body of analysis already worked out. A portion of this latter would be destroyed by Brouwer and Weyl's restrictions. For example, the Bolzano-Weierstrasse theorem that in any closed interval of finite length in which there is an infinity of points, there exists a limit-point, is debarred. Granted any meaning to the clause concerning an infinite number of points, the alternative posed in the course of proving the existence of a limit-point is obviously inadmissible.

[16] *Op. cit.* 448.

A limit-point of a sequence (x_n) is defined as a number G such that for every positive value of ε, however small, there is an infinity of terms of the sequence for which $G - \varepsilon < x_n < G + \varepsilon$. A section is made in the rationals such that all the members of the upper class are greater than any member of the lower. The upper class of rationals is chosen so that for every term A of the class there is but a finite number of terms (x_n) greater than A, while the lower class has, for every member *a*, an infinity of terms (x_n) greater than *a*. The section defines the real number G, which is a limit-point. For if ε be any positive number, $G - \varepsilon$ and $G + \varepsilon$ are members of the lower and upper classes, respectively, and there is an infinity of terms of the sequence between them, that is, in the immediate neighborhood of G, $G - \varepsilon < x_n < G + \varepsilon$. The proof depends on the unacceptable alternative posed in defining the upper and lower classes, "either a finite number of terms or an infinite number".

Many important theorems of analysis go by the board in virtue of their dependence on the principle of Dedekindian section, eschewed by intuition. Dedekindian section is a process involved in defining the real numbers. It consists in completely dividing *all* the rational numbers into two classes, the R class and the L class, such that all members of the R class are greater than any member of the L class. Such division of the infinity of rationals is ruled out by intuitionism, as is also the definition of a real number as an L class. The theorem then which proves the existence of a least upper bound to an aggregate of numbers becomes unacceptable on two scores: it rests on the infinite process of dividing the rationals, and it uses an infinite logical sum to define the upper bound of the aggregate. The upper bound is the class of those rationals belonging to at least one of the L classes defining the various members of the aggregate.

Russell sees in the theorem a difficulty of another order. The boundary class, which is the logical sum of the members of the aggregate, differs from them in logical type, and is therefore not a real number. He meets this difficulty with his axiom of reducibility which makes any property of higher order equivalent in extension to some property of lower order. Thus the property of belonging to at least one of the classes of the aggregate is made equivalent to a property of the same order as that of the classes.

As one might expect, Weyl rejects the axiom of reducibility. And the logisticians are uncomfortable about it on other grounds; it seems to be a statement of fact and not a tautology. Of course intuitionists reject the whole tautology-theory in attacking a basic tautology, "p is either true or false".

It should be remarked that the final note of the intuitionist viewpoint is not on works of destruction. The multiplicative axiom, Zermelo's axiom of inclusion, numerous theorems of analysis, represent casualties in mathematics; but such men as Lebesgue and Borel have replaced demonstrations calling for suspected principles by others not invoking them, and it is possible that the labor of making acceptable some of the unacceptable theorems will be trivial. For example, the replacement of the phrase "any value" by "any assigned value" may provide the remedy in a number of cases. How much of mathematics needs to be or can be reconstructed is still indeterminate. The consequences for logic seem rather more devastating. The unlimited validity of forms of disjunctive reasoning, namely, of the disjunctive syllogism and the dilemma, is a thing of the past.

Of course the toll of casualties of any system of logic does not constitute a logical criticism of it. But as a matter of fact, the decision in this issue cannot rest on logic. Brouwer is unable to show that Hilbert will fall into contradiction, since he cannot exhibit a *tertium;* and Hilbert cannot show that he will not do so. The only grounds for decision left are then extra-logical ones. Once a logic is espoused, criticism of others' views succeeds in being only assertions of a credo—one does or does not take the law of excluded middle as ultimate. When Ramsey asks what difference it makes whether a logical sum is finite or not, inasmuch as the sum states that at least one proposition of the set is true, and when he asserts that contradictory alternatives are either true or false but that we may simply be ignorant which is the case, he really does not meet the objection of the finitist. His criticism in essence reiterates his statement: "I cannot persuade myself that I do not know for certain that the Law of Excluded Middle is true."[17]

The fact that this law emerges in the course of the logistic deduction is a victory for no one but the logisticians and does not

[17] F. P. Ramsey, *The Foundations of Mathematics* (New York, 1931) 66.

touch the issue as to the field of its applicability. True, Brouwer has said that mathematics is prior to logic. And I can sympathize with Paul Weiss' demand[18] that the sense in which this is true be explicated. Weiss's critical comment, however, that despite the above insistence of Brouwer, neither the law of excluded middle nor any other logical law has been shown to be derivable from mathematics, really misses fire. At least a *logical* derivation of the law of excluded middle cannot be demanded of a view deeming logic cursed by its etymology. Such a demand is only properly made of logistics. As to the priority of mathematics to logic, it may be, as Weiss suggests, a priority of time. Or it may be a priority of value. Either sense would seem to be out of place in a discussion of the relation of logic to mathematics.

It is my belief that metaphysical and psychological considerations are irrelevant to logic as a going concern. But if one accepts Brouwer's description of the place of intuition at the foundation of mathematics, philosophic criticism of this notion is criticism internal to the system. For the psychological process of intuition is, according to him, mathematically internal. I think it is indeed unwise for him to stake his all on such debatable grounds. He would by no means admit, what Dresden suggests,[19] that choice of the views espoused by himself and Hilbert was on a par with the choice of primitive propositions or the choice between commutative and non-commutative algebras. As a typical intuitionist, he claims definitive truth—and gains resentment. If everyone were as satisfied as he that his epistemological background was an integral part of his position, it is doubtful whether the mathematical and logical issues would ever be debated with any calm of spirit. It is my belief that such a background is exactly as pertinent to a logical system as the roll of seasons. However that may be, no system can refuse the test of any sort of criticism, and whether intuitionists consider such criticism internal to their view, while others consider it a comment on the philosophic background, criticism is still in order.

Brouwer evidently feels no claim on the mathematical intui-

[18] "The Nature of Systems", *The Monist* XXXIX (1929) 444.
[19] "Some Philosophic Aspects of Mathematics", *Bull. Amer. Math. Soc.* XXXIV (1928) 451.

tion, which is "guarantee of the autonomy of that science",[20] to justify itself in the light of origins. It seems to me a claim not to be ignored. Is his account of the rise of the notion of two-oneness and of an "inexhaustible between" from an intuition of a span of time indefinitely divisible a plausible account of the basis of number and of the linear continuum? Certainly individual history and anthropological data give it no support. The correlation between one's fingers and physical objects is more likely the historical basis of number than the sense of the discrete and continuous in a span of time. And granting with Bergson that the intellect has direct commerce with space and the spatial, not with "concrete time", I should conjecture that the intellectual notion of the linear continuum came from consideration of division of spatial objects or of distances. Any distinction between unity and the number one, so carefully made by the logisticians, is erased in a psychological account. Very few people would have thought of the unity of the temporal span as that number's logical and psychological basis. The definition is about as valuable as the old definition of the infinitesimal as an ordinary magnitude too small to be perceived by the senses, or as James's description of number in terms of strokes of attention.

In Brouwer's defense, I cannot think with Dresden[21] that this epistemology or the fact that the mathematical entities discoursed about are brought into being by a constructive process, *i.e.*, are created rather than discovered, infects the science with subjectivity. All postulates represent a fiat, discovery then taking place within the given set of postulates. The insistence of some logisticians upon an eternal existence of mathematical facts apart from discovery and upon the eternality of truth about them is very unfortunate. "Always at hand when needed is a good enough eternal for reasonably minded persons."[22] Neither the irresponsibility of whim for Brouwer's mathematics nor the rigidity of the immutable for Russell's is a necessary concomitant of the two views.

Intuitionism has been unjustly characterized as concluding from

[20] Rolin Wavre, "Y a-t-il une crise des mathématiques?", *Rev. de Mét. et de Mor.* XXXI 440.

[21] "Some Philosophic Aspects of Mathematics", *Bull. Amer. Math. Soc.* XXXIV 449.

[22] John Dewey, *The Influence of Darwin on Philosophy* (New York, 1910) 147.

the infirmity of our senses to that of our reason. It has been censured for introducing the notion of becoming, claimed incompatible with mathematics. And logistic in turn has been unfairly criticized for not constructing new branches of the science. But criticism of the actual place of the basal intuition in Brouwer's scheme is just. Brouwer says that the logical building-up of mathematics represents a vicious circle since logic itself demands the fundamental intuition. He seems to introduce this intuition thereby into a logical set-up, so that despite his denials it appears to be analogous to the primitive ideas of postulational systems. It is doubtful whether the intuition from which all mathematical sets of units can be constructed is "something in terms of which all undefined ideas of mathematical systems are to be intuitively conceived".[23] At least some of the primitive ideas of Russell's scheme, for example, negation and assertion, seem rather remote from it. I do think the notion of unity-in-diversity a psychologically fundamental one. But a notion taken from spatial or mental contexts needs to be given logical precision and hypothetical ideality.

As for the mathematical issue, with the philosophic implications omitted, I think the crux of the matter is simply the choice between two regulative principles. The acceptance of the law of excluded middle means the belief in the solubility of every problem, since every proposition is viewed as either true or false. The rejection of it probably entails greater precision in the statement of theorems and the confinement of mathematics to a domain of perfect security. It might seem—and of course this is contrary to the spirit of Brouwer—that the issue is one as to methodology, one which will be settled, not logically, but on pragmatic grounds. The logic which makes mathematical development easier and at the same time rigorous will gradually come to the fore. At present the consequences of Brouwer's position are not specific and far-reaching enough to make the outcome predictable. It may be that his caution is a better methodological maxim; it may be that mathematicians will revoke utterly the attempt to block their onward march into new territory—into "the paradise which Cantor created".[24]

[23] Arnold Dresden, "Brouwer's Contribution to the Foundations of Mathematics", *Bull. Amer. Math. Soc.* XXX 33.

[24] David Hilbert.

Meanwhile Hilbert has the initial advantage. Most of the animadversions on the use of actually infinite numbers cannot rest on pragmatic grounds. E. W. Hobson[25] justifies their continuance by reason of their utility in analysis, for example, in investigations of Fourier's series. The objection that infinite numbers make a distinction in the infinite, which allows no determination, is as Hobson points out, pertinent only to some philosophic absolutism. And the *petitio* that number is by nature finite hardly silences the claim that transfinites are justified if they can characterize non-finite aggregates. "This history of algebra shows us that nothing is more unsound than the rejection of any method . . . on account of one or more apparently valid cases in which such method leads to erroneous results. Such cases should indeed teach caution, but not rejection; if the latter had been preferred to the former, negative quantities, and still more their square roots, would have been an effectual bar to the progress of algebra . . . and those immense fields of analysis, over which even the rejectors of divergent series now range without fear, would have been not so much as discovered, much less cultivated."[26] Mathematicians may admit some vagueness about the words "all" and "there exists", but they will in general swallow this difficulty rather than accept the consequences of discarding the law of excluded middle as a universal principle. They are hardly likely to cease analysis on the remote possibility that unrestricted definition may run someone sometime into contradiction. But again I say that Brouwer's precautions may be ultimately most useful. As for the question why a pragmatic postulate is a reasonable one, and pragmatic grounds for decision sensible, I doubt a philosopher's claim to answer. And the demand on a philosopher to answer it rather elevates him to a position of pretentiousness.[27]

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[25] "On the Infinite and the Infinitesimal in Mathematical Analysis", *Proc. London Math. Soc.* XXXV (Nov., 1902) 132.

[26] A. De Morgan, *Differential and Integral Calculus* (London, 1842) 566.

[27] Since writing this article I have substantially changed my views on the contentions of the finitists concerning the strictly mathematical difficulties. A closer investigation indicates that much more can be said for them than is here suggested, and on grounds other than pragmatic.

DISCUSSION

THE *PARMENIDES* IN THE LIGHT OF THE PROPOSITIONAL FUNCTION

THE propositional function appears to have come to stay. Quite likely it is destined, like the axiom, to change its rôle very markedly before its course is run. At present, while it still offers the challenge of novelty, there is the temptation to see if it, in turn, cannot shed new light on old problems. Moreover, ever since Plato (or Socrates), dissatisfied with his understanding of "the reason why one or anything else is either generated or destroyed or is at all", confessed in the *Phaedo* (97) that he "had in mind some confused notion of a new method" it has been a temptation to review his problems in the light of any promising new method. In view of this double temptation, I venture to experiment with the propositional function in that dialogue which most completely displays all sides of the major problem of the One and the Many, namely the *Parmenides*.

The essential characteristic of the propositional function is pointed out in *Principia Mathematica* to be its ambiguity, but that ambiguity must be understood in the sense of undesignated determination. $X + y + z = 9$ is a propositional function, but there is nothing about that form *per se* to reveal whether any proposition determined thereby is $4 + 3 + 2 = 9$ or $11 + 12 + 5 = 9$ or the Battery + the Infield + the Outfield = a Baseball Nine. $X + y + z = 9$ serves as a matrix for all these propositions and many more, even for false propositions. If every value introduced for the variables in a given propositional function were to result only in false propositions, then that propositional function would serve only to determine a null class. If, however, every possible determination constituted only true propositions as with the Binomial Theorem, for example, then the propositional function seemingly has an universal adequacy.

Now propositions, as distinguished from propositional functions, have the same form, but, being composed of individual values, they are either true or false, whereas the propositional function itself is neither true nor false; it simply *is*. If, however, it simply *is* all alone, that is not enough, for merely apprehending pure being has never ended discussion, not even for Plato. Values to fit into matrices also *are*, but merely apprehending particulars *qua* particulars is again not enough. Some determinant must be found in them.

Plato repeatedly recognized these two sides of the problem of reality and of knowledge of reality. In the *Parmenides*, for example, he said that "whoever refuses to acknowledge ideas . . . will utterly destroy the power of reasoning" (135c). In the *Laws* he indicates that the approach to the Ideas is somehow involved in familiarity with present things, for he has the Athenian Stranger ask: "Can anyone

have a more exact way of considering or contemplating anything, than the being able to look at one idea gathered from many different things?" Cleinias vouchsafes a mere "perhaps" and the Athenian Stranger is back at him at once, "Not 'perhaps' but 'yes, truly' my good sir, is the right answer. There never has been a truer method than this discovered by any man" (165). The Many can be understood only in the light of the One, and the One can be reached only by gathering it from the Many.

Unfortunately, pure contemplation of Ideas has seemed, on the whole, to demand oblivion to, if not indeed transmigration from, the world of concrete things, whereas concentration on things has seemed to involve the risk of losing rather than gaining sight of the Ideas. The peculiarity of the Platonic Ideas, to borrow Paul Elmer More's phraseology, is that "the moment that we apply our discursive reason to them, the moment we undertake to describe them in intellectual terms, they melt away into nothingness, like the dew in the clear dry breath of the morning."[1]

Mathematicians seem to be the least embarrassed by this sort of predicament; so I turn to them for further help and from them proceed to the hypotheses in the *Parmenides*. The Binomial Theorem is a most fascinating propositional function; any kind of numbers can be substituted for its variables with true propositions resulting. The Binomial Theorem, however, has the peculiarity which More has noted for the Platonic Ideas: "the moment discursive reason is applied to it, it melts away into nothing". Notice what happens when values are inserted for its variables in its simplest form, $(x + y)^2 = x^2 + 2xy + y^2$. Substitute 18 for x and 21 for y and the result is $(18 + 21)^2 = 324 + 2 \cdot 18 \cdot 21 + 441$. Total this up and what appears is $39 \cdot 39 = 1521$. Now, at this point, we still have an identity, but there is nothing left of the forms in the original propositional function, nor was there in the original propositional function (the Binomial Theorem) anything that even suggested 39 or 1521. The original propositional function consisted of an identity of two descriptive functions $(x + y)^2$ and $x^2 + 2xy + y^2$; but when values are substituted the original variables, signs, indices, in fact the whole binomial form melts away into nothingness.

This happens every time we have the phenomenon of what Peter Abelard paradoxically called the "individualized universal"; but there is nothing about it at all destructive of the Universal, however completely that Universal may seem to have disappeared. It is a bit like the Cheshire cat which so disconcertingly disappears leaving nothing but its smile, and anyone who had not previously seen the cat would be a genius indeed if he could think to what sort of a creature that

[1] More, *Platonism* 183.

smile must belong. The Binomial Theorem leaves so many expressions of identity behind when its body disappears that the uninitiated cannot know what has disappeared, but mathematical geniuses can always make it reappear; and if all who now know it died, taking their knowledge with them, new geniuses, skilled in gathering one idea from many different things, would recover it for themselves, because somehow, it is inevitably "there" despite all change or becoming.[2]

No matter how frequently it has or can become known that such a thing as the Binomial Theorem *is*, no man can know all of it. The totality of possible values and consequently the full import of x and y in the Binomial Theorem, or in any other equally universal determinant, can never be known, for, after all values have been specified to $n + 1$, there is still "n" defying discursive reasoning. Notwithstanding this, despite the total import beyond man's ken, the form, the propositional function, can be recovered as often as it disappears. Numbers from which no forms could be recovered would be chaos and a form with variables for which no substitutions could be made would be empty. Under such circumstances both would be nonsense, if not indeed nonbeing. When, however, there seems to be some sort of a relation to one another in the ways that one form or many forms with variables and the many propositions with concrete values for those variables appear and disappear and reappear, the sense of persistent reality for both forms and values prevails. Could it have been a notion of this which led Plato to conclude the *Parmenides* with the words, "let us say that, whether the one is or is not, the one and the others in relation to themselves and one another, all of them, in every way, are and are not, and appear and appear not" (136)?

While time does not now permit a complete analysis of each hypothesis of the *Parmenides*, I think it possible to indicate that the search for a functional relation *of this kind* is the keynote of each attempt and that the absence of such functional relatedness is the basis for rejecting any hypothesis.

[2] The question arises as to the propriety of implying that the "particular" is the ultimate number 1521. The particular which here corresponds to the universal $(x + y)^2 = x^2 + 2xy + y^2$ is $(18 + 21)^2 = 324 + 2 \cdot 18 \cdot 21 + 441$ as indicated above. Each side of the tautological equation is a descriptive function indicating operations which, with the given values, lead to the number 1521. This ultimate number, as Dr. Herbert Feigl has suggested to me, is only the *name* for what was described rather than being itself the particular. This, of course raises the old problem of the ontological status of whatever the name signifies or of the name itself. In this case 1521 is the right name of $x^2 + 2xy + y^2$ *when* $x = 18$ and $y = 21$; it would also be the right name of a^2b^2 when $a = 13$ and $b = 3$; but 1521 is always 1521 no matter how many descriptions might be so named, and that is what makes it so tantalizing. Quite like the Cheshire cat's disconcerting smile, when nothing is left but the name of the "individualized universal" it is a blind lead indeed to what has disappeared but awaits rediscovery—by geniuses!

Hypothesis I (137c-142b), "if one exists, it cannot be many", is rejected because without a Many the One is expressible only in the redundant futility of "One is One". In the face of this absurdity of a propositional function without variables, inconceivable *per se*, not recognizable, nor recoverable, inasmuch as there are no values when the One is all, the One obviously cannot function. It is folly to talk of it as simply being, and that, according to the dialogue, will not do.

Hence to Hypotheses II and III (142b-157b), where it turns out that if One exists, it must be Many, but there is a subtle elusiveness about the shift back and forth between One and Many. Surprisingly like the Binomial Theorem, the One appears and disappears and ever goes through a mysterious "instant" of transition. It is older and younger simultaneously in the same sense as the binomial theorem can be both prior and subsequent to any binomial values. "And being one and many and being generated and destroyed, when it becomes one, its existence as many is destroyed" (*i.e.*, when it is a propositional function, the values for the variables are not evident); "and when it becomes many, its existence as one is destroyed" (*i.e.*, when values are substituted, the propositions appear and the parent function "melts away into nothingness") (156b; Fowler's translation).

Hypothesis IV (157b-159b), dealing with the question what happens to the things other than One if One exists, reaches its crucial point in the passage, "The result to the others flowing from the one is that the union of themselves and the one appears to give a new phenomenon of limitation in relation to one another, whereas in their own nature they have no limit" (158d). Form and values limit each other in relation to one another, whereas in their own nature the Many or values have no limit. This thought is pursued farther in Hypothesis V (159b-160b), where it is shown that for the Many, other than One, nothing is possible if they are "in every way utterly deprived of unity" (160b). Apparently there must be some functional relation between the One and the Many in order to escape the alternatives of nihilism or chaos.

Suppose, however, there is no One. That is Hypothesis VI (160b-164b). This supposition culminates in the assertion, "The non-existent one has and is nothing at all" (164b). Such an One (and as the dialogue says, even its existence cannot be denied without making some assertion about it) has all the earmarks of a propositional function whose variables, if any, have no admissable values, and such a function assuredly "has and is nothing at all".

Finally in Hypothesis VII (164b-164c), if the Many exist so must the One, for Others cannot be other than nothing or than vague, ununified "masses of other". In fact, "if one is not, nothing is". Values without functional forms are again nihilistic.

Thus every hypothesis has its crucial test in whatever it may offer of functional possibilities for the relation of the One and the Many. A. E. Taylor concludes from the *Parmenides* that crude idealism, which places reality in mere undiversified unity, and crude sensationalism, which places reality in mere chaotic diversity, both end in speculative nihilism.[3] Granted that the *Parmenides* warns against such nihilism, I wonder if the dialogue does not also carry the suggestion that the One and the Many are necessarily in this sort[4] of functional relation.

Inevitably upon this claim follows the question what, if any, advantage this interpretation has over a Whole-Part conception of the One and the Many. For the briefest possible answer to that, let it be remembered that Plato himself persistently wrestled with the whole-part interpretations of his own doctrines. He debated it à-propos of the virtues or of the absolute and the concrete in the *Protagoras, Meno, Republic* and in the *Parmenides*. Not once in such a discussion was he conclusive or apparently satisfied with that approach. Yet with the less indecisive copy and participation theories, he seemed always to be trying to escape the real dread voiced in the *Sophist* (249), "Oh heavens, can true being remain forever in awful unmeaningness, an everlasting fixture?" From the functional standpoint, herein presented, the Ideas might have enduring stability as matrices for varying particulars.

The satisfaction in this interpretation lies in conceiving "Ideas" and "particulars" without the merged identity of the whole-part union, both still distinct and yet so correlated that the Ideas are permanently, functionally stable, effective in determining order in particulars, always rediscoverable by those who can "look at one idea gathered from many different things", and ever intrinsically fascinating for the soul to contemplate, as Plato would have them. Such satisfaction would seem to be somewhat akin to and yet much greater than the thrill a mathematician may enjoy in having the Binomial Theorem admit all kinds of numerical values—positive and negative integers, powers and roots, rational and irrational numbers—without making them over, and all of this without ever sacrificing its own integrity.

[3] *Mind*, July and Oct. 1896, Jan. 1897.

[4] As the word "function" means so many things to so many people from psychologists to mathematicians, it is necessary throughout this article to qualify its every use by emphasizing "this sort" of functional relation, namely that between the propositional function and its propositions, especially those which Whitehead and Russell designate as second-order matrices, which necessarily have as their arguments first-order functions and may also have individuals. These second-order matrices seem most nearly compatible with the second part of the *Parmenides*, which is usually interpreted as a discussion of the relation of the Idea of the One to Ideas of the Many, but does not necessarily preclude the relation of the One to the Many individuals.

Herewith it must be admitted that this interpretation does not solve the mystery of the One and the Many, but it may contribute to resolving the issue as Plato presented it into definite kinship with a very modern way of facing the same problem. The claim to consistency, if not identity, between this aspect of the modern mathematical logic and Plato's aim lies in the fact that the Idea does not lose itself in participation, nor does it remain in splendid but meaningless isolation. With such functioning, the Idea escapes "awful unmeaningness" and imparts truth both to the thing known and to him who knows.[5]

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MORRIS'S *SIX THEORIES OF MIND*[1]

IN THE exposition of philosophical theories other than his own the author is usually skilful and illuminating, as well as painstakingly fair. His book presents a clear and well-documented survey of an extensive series of modern doctrines, epistemological and metaphysical, classified in what seem to him the most significantly contrasting logical genera. In the case of certain recent theories—those of Laird, Strong, Russell, Dewey and the present writer—Mr. Morris has submitted his expositions to these authors, some of whose explanatory comments are included; in the case of Dewey and Russell these are important, as qualifying or clarifying contentions previously expressed by them. The general scheme of division summarized in the title is perhaps a little misleading. The bond of union among the "six theories" is that they all might be—though by their proponents some of them are not—expressed in the form of propositions that "mind is" something or other. But no initial definition of the nominally identical subject of these propositions is given, and the term is far from unequivocal. It does not clearly designate any single factual issue at all; the theories are not accounts of the elements, preconditions, properties, or behavior, of an already determinate existent "mind"; they are simply different ways of using the words "mind" and "mental". Certain of them are negations of the existence of the entities or events which, in certain others, are signified by these terms, with redefinition of the latter to serve as names for entirely different entities. Mr. Morris's real theme, for the most part, is the empirical phenomenon of human knowing—including therein sensation and perception—and the theories reviewed are mainly answers to the question: What is involved in the occurrence of that phenomenon—what is given in and

[5] *Rep.* 508e.

[1] *Six Theories of Mind.* By Charles W. Morris. The University of Chicago Press, Chicago, 1932. Pp. viii, 337.

presupposed by cognitive events, assuming that there are such events, and that, specifically, we can refer to, and make probably valid judgments about, certain classes of existences other than the bare, momentary, uninterpreted data of immediate experience? The volume as a whole, and the real interconnection of its parts (except for occasional digressions), would, at all events, have been clearer for a more explicit formulation, at the outset, of its topic in the form of an unequivocal *problem*, and an examination of the logical conditions under which such a problem can be properly discussed. The views actually dealt with, moreover—under the heads of "mind as substance, as process, as relation, as intentional act, as substantive, and as function"—in some cases are, and in others are not, as the reader might suppose, mutually exclusive; those who have held the first, for example, have as a rule also held certain doctrines classified under the second, fourth and fifth rubrics, though the converse is not necessarily the case.

The purpose of the book is not, however, chiefly expository; it is to arrive, by means of a critical examination of all the more important attempts to deal with the question mentioned, at a tenable conclusion thereon. Something—though in certain cases very little—is found deserving of retention in all six theories; only the last, which is "Dewey's form of objective relativism", is, or appears to be, accepted by the author as an essentially correct and adequate answer. The doctrines examined under the first head—"mind as substance"—are the Cartesian dualism, the scepticism of Hume, and the Berkeleian and Kantian forms of idealism. The second chapter deals chiefly with objective idealism (Hegel, Bradley, Bosanquet), with "idealistic activism" as diversely represented by Leibniz, Bergson (in this case somewhat equivocally), and Gentile; and concludes with a summing up of the case against all forms of "mentalism". The four remaining classes of theories are, or are construed as, variant types of realism, logical or physical or both; to these the greater part of the volume is given. The contemporary doctrines most fully discussed and—at least with respect to their most distinctive conceptions—rejected are those of the American new realists, of G. E. Moore, S. Alexander, Laird, Whitehead, Russell, Strong (in his earlier writings), Santayana, the panpsychists and the double-aspect theorists. Most of the author's criticisms of these views seem to me acute and sound, though, naturally and properly, they are not in general novel in substance, and some of them are too brief to cover thoroughly the issues involved. The only one of these doctrines of which I find the criticism wholly unpersuasive is the thesis of the indispensability, in any satisfactory account of sensation, perception, memory, etc., of the recognition of the unique "mental" event, act or state of "awareness". I

shall not take the space requisite for an adequate examination of Mr. Morris's reasonings on this point; it must suffice here to observe that he himself throughout assigns to "experienced events" the peculiar status of "givenness", or "being presented"; that he apparently regards this status as conferred upon those events by the "activity" of the sentient or cognitive organism; that he does not attempt to reduce this status to physiological or behavioristic terms; and that I am therefore unable to see that his "givenness" is anything other than "awareness", described, so to say, in the passive rather than the active mood.

The rest of this discussion will be devoted to a (necessarily brief) examination of the relation of the theory accepted by Mr. Morris to the type of dualism which I have elsewhere attempted to set forth and defend. I do this, I suppose, because it is, naturally, in this part of the volume—roughly, a third of it—that I am most interested; but there are some more objective reasons for dwelling chiefly upon this question. It involves the most crucial issue in the author's constructive argument. Dualism of the kind in question is definitely for him the last great river to cross in the march to the promised land of an "objective relativism" in which "mental entities" shall cease from troubling, "nature" shall be undivided into separate realms of being, and knowledge shall be a "natural event" not essentially different from others. But it is also in the statement of his positive conclusions that Mr. Morris is most likely to be misunderstood. He is, I cannot but think, often less clear in expounding his own theory than other men's. There is much in the two concluding chapters which would lead the reader—and apparently sometimes leads the author—to imagine that he has crossed the river. But this, as I shall show, is not the case. Between the position which he reaches and the sort of dualistic realism which he has frequently the air of opposing, the difference is one of terminology, not of logical substance. There happily proves, on close scrutiny, to be an essential identity of doctrine where there at first sight appears to be conflict. It is especially as evidence of a real, though somewhat concealed, convergence of opinion on the main epistemological and metaphysical questions that the book seems to me a noteworthy contribution to contemporary philosophical inquiry.

Throughout most of the volume Morris appears definitely to accept epistemological dualism, upon grounds now familiar. The arguments for it which are most emphasized are those from the possibility of error and from retrospection. "To deal with the problem of error, . . . some distinction between the object of knowledge and the vehicle of knowledge had to be recognized. Without some such distinction it becomes impossible to admit that thought can be about the non-existent" (213). "The very existence of error seems to require

some type of duality, since if knowledge is always direct error would be impossible" (143). The ingenious attempts of various neo-realistic writers to reconcile the fact of error with a monistic theory of knowledge are reviewed, and rejected as "unsatisfactory". So, also, in the case, "at least", of the knowledge of "objects that are not merely no longer present, but no longer are, . . . it is necessary to admit that there is some duality between present content and the past claimed to be known, some intermediate 'ideas', whether Cartesian or pragmatic in nature" (144). It may, then, be regarded as an established result that "knowledge is mediate or vehicular". Thus the "central problem", the "great divide in contemporary philosophy", is the question whether "epistemological dualism or pluralism requires a psychophysical dualism" (214). But later in the volume the author seems to qualify his position on the former issue; while "knowledge requires a vehicle, . . . the contention that this vehicle cannot be a part of the existent known, so that the object of knowledge is not given", is denied (266). The vehicle is thus identical with a portion of that *of* which it is a vehicle; in other words, with respect to this "part of the existent known", it is *not* a "vehicle", and knowledge is here not mediate but direct. Morris, it would seem, thinks that, by saving a remnant of immediate cognition, he has escaped the supposed difficulties of a dualistic epistemology. But it is evident, in the first place, that the crucial issues are not touched by this reservation. If *only* a "part of the object" is known directly, the rest of it is known mediately; and the knowing of this part (which seems in any case to be much the greater part) must still be by means of "ideas, whether Cartesian or pragmatic". And, the "central problem", *viz.*, whether these ideas are parts of the physical world, is unaffected by the small residuum of epistemological monism which Mr. Morris attempts to retain.

Nor does he in fact retain even this. For the "part of the object" which is said to be directly given proves to be a part of it only in a Pickwickian sense. The "attributes" of any object are so *defined* as to include certain remote effects conditioned, in part, by the existence of the object; the effects in question are sense-data, memory-images, and "given contents" in general. But that these are (in the terminology of the present writer) both "causally and existentially subjective" is affirmed. The correctness of the generative theory of sensa and other data is repeatedly insisted upon. "Some given content, if not all, is emergent upon the presence of the organism" (114), and "the view that sensory contents exist when not given . . . does not seem destined for high success" (248-9). "Where givenness requires presence in a perspective conditioned by an organic center, and when it is admitted" —as it is by Mr. Morris—"that the events in question are so conditioned, there remains no further sense in which events that are given

may be said to exist when not given" (249). Nevertheless there is, he thinks, one—though only one—"essential difference" between this and the dualistic conception, *viz.*, that "objective relativism primarily asserts that although certain events are emergent upon and exist only in the presence of a percipient organism, these events are objective in the sense of being existential attributes of the physical object attended to" (253). This difference, however, is purely terminological. The author has simply chosen to attach a new meaning to the expression "attribute of an object". Given his definition, his conclusion follows, but the argument is a wholly verbal one.

This may perhaps best be seen by considering his account of what occurs in the perception of a distant—and possibly no-longer-existent—star. He describes this event in a fashion which sounds both epistemologically and psychophysically monistic—and, indeed, seems to exclude any possibility of error in the presentation of that object. The star, we are told, "is not only seen where it now is, but as it now is". But "this does not mean that the given event is the same event that would be given if one were . . . at the astronomer's star". It means "simply that under the conditions of the organism, the medium, and the finite velocity of light, the star itself assumes a certain character, namely, the character that is seen", *i.e.*, the character which distinguishes the visual sensum (256-7). The sensum and its quale, in other words, are emergent effects at a certain place and time of (*a*) a star's existing, or having existed, with its own qualia, somewhere else, and (*b*) of numerous temporally and spatially intervenient events, and (*c*) of the "creative" efficacy of the organism in finally generating the sensum after the light reaches the retina and the neural impulse reaches the cortex. Nevertheless the entity, *i.e.*, the particular instance of a certain quale, which is thus generated, is, Mr. Morris insists, a "genuine attribute" or "character" of the *star*. "This character, further, is a present character and compresent with the process of experiencing" (*ibid.*)—Q. E. D.

This argument is not in conflict with any dualism, epistemological or psychophysical, which anyone, so far as I know, has ever held. It only seems to be so because the same words are used without the same meaning. The *cognoscendum*, the specific object to which the dualist's thesis refers, in the case of the star, is what Mr. Morris himself distinguishes as "the *astronomer's* star", an object specified by definite spatio-temporal limits; and by *its* characters are meant particular instances of certain qualities, existent within that spatio-temporal region and not elsewhere, and not dependent upon percipient events. It is these characters that are declared by the dualist not to be existentially identical with those of the datum; *i.e.*, though they may be other particular instances of the same kinds of qualia, they are not the same in-

stances. That they *are* the same nothing in Mr. Morris's reasoning here shows, or even asserts, since he is talking of quite other "characters", *viz.*, particular qualia which are admittedly not present in the spatio-temporal region of the astronomer's star, depend for their existence, not upon the conditions sufficient for the existence of the star, but upon these *plus* a long series of other conditions in other times and places, including the activity of a brain in generating a new emergent (*i.e.*, a visual sensum), and apparently are not (for him) even similar to those of the star. Thus Morris's seeming residuum of epistemological monism proves to be only an odd way of expressing epistemological dualism. Similarly, the proposition that we see the star "as and where it now is" turns out to mean precisely what other people mean when they say that we do not see the star as and where it now is. It seems to me strange that objective relativists should take so much satisfaction in "paying themselves with words" in this fashion.

It does not, indeed, follow from these observations alone that the sensum or the image is not "physical". What follows is that you cannot prove, and do not say, that it is physical, in any relevant sense, by first defining the astronomer's star as physical and then declaring, *e.g.*, the sensum or its quale to be an "attribute" of the star, in the author's sense of the term. Nevertheless it is—so far as I can discern—wholly in this manner that the author is able to *seem* to escape psychophysical dualism. His argument, in full, runs: (1) the sensum, as an emergent effect of the activity of the organism when acted upon by a stimulus coming from a distant star, is, in the sense defined, an "attribute" of the star; (2) an attribute of a thing is a "part" of it; (3) the astronomer's star is physical; (4) therefore its parts are physical; (5) therefore the sensum is physical. If (2), (3) and (4) are taken as a definition, the conclusion again follows; *i.e.*, if *any* effect partly due to the existence of a physical thing is by definition "physical", the sensum, being by hypothesis such an effect, is physical. But the conclusion here too is merely verbal. That the sensum is "physical" in the dualist's sense—or in the usual sense in which the astronomer's star is said to be physical—does not follow in the least. Nor does Morris hold that, in this meaning of the term, sensa or other "given contents" *are* physical. Not only are they, as we have seen, emergents conditioned by a unique functioning of the organism, and existent only so long as and in so far as they are "given", but they are "private", "not in the space of physics" nor necessarily in any relation whatever to space (254); they do not conform to the laws of physics, and are not factors in the executive order of nature apart from being perceived (247-9). Morris, in short, accepts completely what I (and, I take it, most persons nowadays) understand by psychophysical dualism. "Given contents" for him differ from things like

"astronomer's stars" precisely in those ways expressed, in the language usually current, by calling them, not physical, but "mental". It is true that they are for him conditioned by physical, including intra-organic, events; but so they are for many dualists, including the writer. Thus it appears that we both stand—with a number of others—upon the same side of "the great divide", though Morris prefers to use his own language in describing the landscape to be found there. Unfortunately this language, being framed by a systematic inversion of the prevalent meanings of terms, is likely to cause unwary readers to imagine him to be describing the landscape on the other side.

This foible for the expression of what is, upon analysis, an unmistakably dualistic doctrine in a monistic-sounding phraseology is especially striking in the final chapter, which is the more interesting and important because it sets forth not only Morris's conclusions but also Dewey's. It is in great part a cento of well chosen passages from the latter writer, and has been formally accepted by Dewey as a "presentation and interpretation of his views" (viii); and in the conveyance of these it has the advantages which result from brevity. Its thesis, that "mentality is a functional character", is often presented as an emphatic negation of, and a clear alternative to, the dualisms both of datum and cognoscendum and of mental and physical. "Thought" may, indeed, be *called* "mental", but "not because of a peculiar stuff which enters into it or of peculiar non-natural activities which constitute it. Even images are not made of physical stuff; they are qualities of *partial* organic behaviors, which are their 'stuff' " (296; the expression is chiefly Dewey's). Knowing depends upon the symbolization of one event by another, "but the symbol is one particular natural object which 'refers' to something else of the same order of existence as itself" (298). "The distinction between the given and the non-given cannot be satisfactorily regarded as marking the difference between two orders, mental and physical." "The given is composed of attributes of physical objects" and "given events are not intrinsically mental or cognitional"; when this is recognized, "the genuine differences between natural existents need not be transformed into a dubious psychophysical dualism or into a self-defeating epistemological dualism in which no knowledge claim concerning physical nature can be verified through the appearance of that which was intended" (270). The repudiation of all dualism, it would seem, could hardly be put in stronger terms. Yet in fact it is not repudiated at all; for its essentials are not less strongly affirmed, and the sentences quoted, when their signification is gathered from the context, are found not to mean what they would most naturally be taken to mean. The sense in which "the given" is "composed of the attributes of physical objects" is still merely the sense previously noted, *viz.*, that its genesis is conditioned

by an interaction between an external object and an organism. "The position" of both philosophers "is still a generative rather than a selective theory of the given" (303); "the interactions of the organism with the natural world are genuine additive phenomena" (294). The emergent product of this interaction is obviously not identical with either of the two sets of "prior existences"—the causal object, the stimulus, *etc.*, on the one hand, the generative organism, on the other—by the interaction of which it is produced; but if, or in so far as, there is knowledge of those prior existences, this knowledge must be mediated through the emergents, since they alone are given. Thus, necessarily, "Dewey rejects immediate (unmediated) knowledge" (303). In this theory also, then, "no knowledge claim concerning physical nature"—in so far as "physical nature" includes the causal object, *e.g.*, the star or its components, the transmissive process, and the physical organism—"can be verified through the appearance of that which was intended" in any judgment purporting to refer to such objects. This implication is in some passages pressed to highly sceptical consequences: "What already exists can never appear since what appears is always an emergent character produced by the interaction of prior existences. It results that the largest part of nature cannot appear or be known, indeed *nothing existing at the moment of action can ever be given*. A great range of nature is not only unknown but is literally unknowable" (318, italics in original); in other words, *all* "nature" except the emergent datum is unknowable. Thus the supposedly "self-defeating" character previously imputed to epistemological dualism is here ascribed to objective relativism, and is so because the latter is identical with epistemological dualism. However, this sceptical consequence is presently declared—as it is by other dualists—not necessarily to follow from the conception of knowledge as mediated through organically generated data. The prior existences—*e.g.*, the causal object and the physical organism—are, Morris observes, "of course presupposed in the very statement of a generative theory" (318). To deny that such existences can be "known is only to distinguish verified claims from probable claims. Of course, if propositions in the higher ranges of probability are included in knowledge, prior existences might be said to be known" (*ibid.*). Not only with the "that" but the "what" of the "prior" or causal objects—*i.e.*, of physical objects in the ordinary sense—we may reasonably claim some acquaintance. "Dewey writes: My 'metaphysical principle' is that the related foreground"—*sc.*, the experienced content—" 'may be taken as a method for determining the traits of the background'. The foreground, as one aspect of reality, can be taken as a sample for descriptive generalization . . . of 'the more ultimate traits of the world'." These ultimate traits include "time, or genuine change in a specified direction; . . . likewise, 'the

evolution of life and mind indicates the nature of the changes of physico-chemical things and therefore something about those things' " (327). The nature of the "probability" ascribed to these epistemological conclusions is left rather vague, and the ulterior problems and seeming difficulties to which they give rise are not dealt with; but the conclusions themselves are simply those of a familiar form of dualistic realism. An equally dualistic account is given of our knowledge of the past. Dewey, referring to a previous discussion with the present writer, says that he "never meant to question that some judgments make explicit reference to the past, nor that in some judgments this is the only *explicit* reference"; and, with his approval, Morris adds that "in judgments about the past, no direct intuition of the past event or existent is possible, since the event cannot appear *in propria persona*" (316). Hence no retrospective judgment is capable of literal empirical verification; but this does not "remove it out of the domain of probability. And probability is a concept worthy of the deepest respect" (*ibid.*).

The ostensibly anti-dualistic proposition that the emergents which perform the symbolic function, and are thus the vehicles of our knowledge of the not-immediately-given, are "natural objects of the same order of existence" as that to which they "refer", proves to have an equally evanescent meaning. *What* thus emerges, and in doing so makes cognition possible, would be regarded by most persons as a decidedly "peculiar stuff". The "additive phenomena", *e.g.* sensa, are not conceived as ponderable secretions, nor as new-born atoms or electrons, nor as any other entities which, once generated, go on existing, shifting their relative positions, radiating energy, *etc.*, when not present in experience. "Although mind is not regarded as a collection of psychic events, it is agreed that mind involves certain characters which may, if desired, be called psychical in order to differentiate them from other characters of physical objects" (329). But these "other characters" are, for ordinary usage, precisely the *defining* characters of "physical objects", and the characters which "may be called psychical" are those which usually *are* called psychical, *viz.*, occurrence in a manner alien to the laws of physics, and existence only as and when given for an individual organism and by virtue of a special sort of "creative activity" on the part of that organism.

There remain some further theses, relevant to other issues, which Morris presents, with Dewey's endorsement; on these I shall not touch, being of the same opinion about most of them. I am content to have shown that two of the theories in question, theories which are differently labelled and phrased, and which readers of the book might naturally suppose to be not only distinct but antagonistic, are, on the fundamental matters, in complete agreement. "Behold, how good and

pleasant a thing it is for brethren to dwell together in unity." But when they really do so, it seems a pity that any of them should so express themselves as to give to strangers and to their common adversaries the impression that they do not.

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What Plato Said. A Résumé of the Entire Body of the Platonic Writings. By PAUL SHOREY. Chicago, University of Chicago Press, 1933. Pp. viii, 686.

A résumé of the contents of the whole Platonic Corpus by a veteran scholar of the standing of Professor Shorey cannot but be welcome to all lovers of good literature and good philosophy. They will all join in the hope that they may not have too long to wait for the further promised volume which is to contain just what the plan of the present book compels the author to omit, a "Study of Science in Plato". (It is not all of us who are in the position to consult the numerous scattered articles in American publications in which Professor Shorey, as he reminds us, has anticipated some of the contents of this promised work.) To a reviewer who gratefully remembers the value to himself of an earlier publication of Professor Shorey, and who shares a great many of the convictions which inspire *What Plato Said*, it is an unwelcome task to have to begin his comments on this handsome volume with any words of disappointment. And yet there are one or two features of the book which, I own, distress me, and on which it would not be candid to keep complete silence. For one thing, I cannot but regret that, in the effort to be vivid, the author too frequently allows himself, in reproducing or commenting on the language of the greatest of all prose writers, to lapse into slang, and slang of a kind which grates very unpleasantly on a European ear. I cannot think that such an expression as "a hayseed and a fundamentalist" should be put into the mouth of a speaker in a Platonic dialogue, or that it is permissible English to write in so grave a work such a sentence as "He cannot have influenced Plato much, *if any.*" It is true that some of this language (and there is a good deal of it in the course of the work) may be annoying only to the Briton, and that the Briton has no right to expect an American author to conform exactly to his own standards in such matters. But, after all, it is desirable that Professor Shorey should be widely read outside his own country, and it is therefore perhaps a pity that he should not allow for our little susceptibilities.

There is another matter about which I feel it more difficult to speak. Professor Shorey's way of referring to other students of Plato reminds me more than I could wish of Johnson's *mot* about Milton, that hardly anyone who wrote so much has been so chary of commendation of others. We are reminded, as I think, rather too often of the transcendent merits of a certain work on the *Unity of Plato's Thought*. It was, to be sure, an excellent piece of work, and I believe all serious students have always been very thankful to Professor

Shorey for it. But one would prefer to hear of its merits from others than its author. As things are, any writer on Plato is placed by Professor Shorey in a rather difficult position. If he agrees—as I hope most of us do—with many of the positions of the work, he runs the risk of a suggestion of disguised borrowing. If he disagrees on any point, he is told magisterially that his views are mistaken, or "fantastic". If he discusses any problem not raised in the book, he is accused of wasting his time on an "idle" question. I cannot think this tone quite generous in a scholar whose achievement should make it easy to be generous. I should also like modestly to represent to Professor Shorey that questions upon which eminent scholars are divided in opinion cannot be simply decided by the employment of a contemptuous epithet. It is easier to fling about such epithets than to argue one's case, but, after all, expressions of contempt will not take the place of proof, and on such questions as the genuineness of the Platonic *Epistles* a reader has some right to expect at least an appearance of proof. The manner of Bentley at his worst sat badly even on Bentley himself. And it is no disparagement to contemporary scholars to say that there has been no second Bentley.

I should say that the foregoing remarks apply, from the nature of the case, chiefly to the two opening chapters of Professor Shorey's book, in which a general account is given of the life and writings of Plato, and to a minor degree, to some of the abundant notes which have been placed together at the end of the volume. More than one statement made about Plato's personal history with apparent confidence would, I believe, be admitted by Professor Shorey himself on second thought to be more than questionable. Thus it ought to be clear that if Plato ever fought in a battle near Megara (p. 5), it certainly cannot have been that in which Adimantus and Glaucon are said in the *Republic* to have distinguished themselves. For Plato would be too young to be fighting before 409 B.C., whereas we see from the *Apology* that Adimantus was so much his senior as to stand to him, as we say, *in loco parentis*. Now the performance of Adimantus and Glaucon is said in the *Republic* to have occasioned a laudatory poem by a 'lover' of Glaucon. We may fairly infer that both men were young at the time and were 'winning their spurs'. The battle in which they distinguished themselves must then have taken place years before Plato was old enough to see service. Similarly, Professor Shorey can hardly be right when he positively asserts on the same page that the occasion mentioned in the *Gorgias*, when Socrates raised a laugh by making some mistake in the taking of a vote, was the famous trial of the Arginusae generals. Before that date Alcibiades had left Athens forever in disgrace with the populace, and was apparently living in his castle in the Chersonese. But in the *Gorgias*

the possibility that the people may yet turn against Alcibiades is mentioned as a future contingency; this, of itself, should show, I think, that the conversation is dramatically dated not only before Arginusae but before the scandal of the 'profanation of the mysteries', and presumably, as it professes to be, in the years just after the death of Pericles, when Alcibiades was popularly expected to 'step into the shoes' of the dead man. So when I am told on p. 6 that Plato "must have known" Alcibiades, I cannot help thinking Professor Shorey has forgotten chronology in a way in which he would hardly allow another writer to forget it. For Alcibiades was never at Athens after the sailing of the great expedition against Syracuse in 415, except for two or three months in the summer of 407. Plato was too young to have known him before 415, and the two or three months of his return eight years later leave no time for much personal knowledge.

It is similarly at the least a loose way of speaking (p. 17) to refer to the discovery that "morning star and evening star are one" as *recent*, apparently in Plato's life-time, when the tradition is that the identity had been actually mentioned by Parmenides, who was an old man in the early youth of Socrates. These are, of course, in themselves trifling matters, but they do serve to suggest a certain caution about pronouncements for which no justification is given in Professor Shorey's work beyond an *ipse dixit*.

The whole discussion of the Platonic *Epistles* in the second chapter seems to me to be vitiated by this tendency to offhand dogmatism. Of course we all know that Professor Shorey long ago committed himself to the view that the *Epistles* are one and all spurious and it is only natural that he should be very unwilling to concede more than he can help to the modified reigning opinion on the point. But in view of the distinction of some of the scholars who have taken the other side, and the weight of the arguments they have been able to produce, I think it might have been fairly expected that Professor Shorey should attempt some serious refutation of their views. I cannot see that he has anywhere condescended to do this. On the genuineness of VII and VIII, so far as I can understand his language, he now tends to 'hedge' with an inclination in favor of rejection. The rest of the collection are dismissed with a sneer or an *ipse dixit*. Thus of III we are told nothing except that it is "obviously spurious" (p. 48). But when we remember that Eduard Meyer, who was perhaps as well entitled to an opinion as Professor Shorey, regarded this letter in particular as "obviously genuine", we surely have a right to ask the oracle of Chicago a reason for its pronouncement. IV, VI, XIII are all dismissed in the same offhand way, with the added complaint that XIII is 'picayunish', an epithet which carries no meaning whatsoever to the mere Briton. VI is elsewhere said to be silly, though

it is not explained in what the silliness consists. Was it 'silly' to think that Hermias might derive useful practical suggestions from students trained in the Academy, or to suggest that such men might find themselves in need of a 'protector' in the outside wicked world? Or is the 'silliness' only a 'dyslogistic' epithet for the playful 'oath' of which the writer speaks? In the case of II something like an argument is suggested (p. 47) when the famous 'enigma' of the letter is described as "mystical theosophical drivel", but I doubt whether the argument will hold water, even in this case. Has Professor Shorey reckoned with the possibility that the whole passage is a polite 'snub' to an inquirer who has put a question which he was not entitled to put, and yet, from his position, must not be told so in so many words? If a German princeling had asked Hegel to give him 'in a nutshell' the secret of his philosophy (and this is apparently what Dionysius is supposed to have asked of Plato), I think it not unlikely that he might have got some such riddling answer, though Hegel's philosophy was something different from "theosophic drivel". The arguments used against XI (Plato to Leodamas) are more respectable, but again seem to me singularly inconclusive. "He is put off with evasions, commonplaces, and reminiscences of the *Republic* and *Laws*" (pp. 48-49). But does this mean more than that Plato politely declines the position of adviser? We all of us have at times to write letters in which, for one reason or another, we excuse ourselves from undertakings, and courtesy requires that we shall not do so in an offensive way. Such letters cannot, from the nature of the case, be expected to contain anything very remarkable, even when the writer is a Plato. Even a genius has to say "How do you do? I am sorry I cannot oblige you", and the like, much in the same language as lesser men. And if Plato was asked to assist in the foundation of a colony and declined, even in a commonplace letter, the incident might interest the Academy sufficiently to account for the preservation of the document. I am far from suggesting that these considerations *prove* the genuineness of the impugned letters, but I think they do deprive Professor Shorey of the right to treat a disputant with him on the point with the contempt he has chosen to display.

There are two other matters in connection with which there is some display of the same temper. There are sentences, specially prominent in the chapter on the *Philebus,* which pour ridicule on a number of unnamed scholars who are accused of wasting their time in looking in Plato for a secret philosophy not expounded in the dialogues. If I have rightly divined the address of these sallies, the persons meant are all those who have, successfully or not, attempted to interpret the accounts given by Aristotle of what he took to be the Platonic metaphysic. (I also suppose that I am myself one of the

sinners denounced, and that Julius Stenzel is another.) But surely the language used about esotericism amounts to an unconscious rhetorical perversion of the issue. (Cf. the expressions of the first paragraph of p. 320.) There is no question of a 'secret' doctrine at all; the question is about something Plato is supposed to have taught perfectly openly in the Academy. No one will deny that Plato habitually gave oral teaching there, and no one, I conceive, supposes that in this oral teaching he did nothing but repeat things which he has written in his dialogues. And we have the explicit testimony of Aristotle that in this teaching certain definite statements were made. We may think as poorly as Professor Shorey appears to do of Aristotle's attempts to explain what these statements meant, but it is another thing to doubt his assertion that, whatever they meant, they were made. The less satisfactory Aristotle's explanations of them are, the more real is the problem what they really convey. There is no reason why Professor Shorey should interest himself in the problem if it does not appeal to him, but there is every reason why he should abstain from disparaging others who are interested in it. The tone which he allows himself to adopt does not seem to me worthy of his real eminence as a scholar.

The other question with which the same impatience is shown is that of the relation of the thought of Plato to that of Socrates. With very much of what is said on this matter in the opening chapter, indeed, I find myself in sympathy. Professor Shorey even goes rather further than I think I should now do myself in discrediting Xenophon as a competent witness to the thought of Socrates. In the main his declared view is that of Emerson that Socrates and Plato are for us a "double star" which our telescopes do not permit us to decompose. Now I should have thought this a natural prelude to the view that the Socrates of the *Phaedo* and *Symposium* is for all serious purposes the "historical Socrates", though glorified, no doubt, to an extent not wholly ascertainable, by the recollection of his martyrdom, and treated much as a 'sitter' is always treated by a painter of genius. And if that is what is meant, I should say at once that in substance it is precisely what I believe myself and what was believed by Burnet. But the curious thing is that in spite of his quotation from Emerson, Professor Shorey insists that he *can* decompose the "double star" with the result that, apparently, nothing in what is called the 'ideal theory' is Socrates at all; it is all Plato. At least this must be the meaning of the not very mannerly outburst on p. 21 about a "much-advertised speculation" that everything in the Platonic writings up to and including the *Republic* is Socratic. Since the address of these remarks is unmistakable, and Professor Burnet is no longer with us, I may be pardoned for a remark or two upon them. (I say nothing

about the phrase about 'advertisement', which is apparently meant simply to wound, except that neither Burnet nor myself ever desired or sought advertisement.) Professor Shorey disposes of a case which, whether good or not, has at least been put forward on a considerable amount of evidence, by saying merely that it "involves the monstrous paradox that the world's most affluent and precise thinker never wrote a line and that the writer who gave consummate expression to all this wealth of thought formulated no ideas of his own till he was past the age of fifty". Now this is mere rhetorical misrepresentation. That Socrates wrote nothing is explained at once by the habits of the Athenians of the Periclean Age, to which he belonged. They were not a society of writers, as Professor Shorey of course knows. And the second half of the sentence credits Burnet and myself with a statement which both of us would at once repudiate. If it be granted that the impulse to the so-called 'ideal theory' came to Plato from Socrates, as Professor Shorey himself admits that the impulse to the ethical doctrines of the *Protagoras* did, it is still ridiculous to suppose that a work like the *Republic* could have been written by anyone without immense labor of thought. If Professor Shorey would replace his caricature by the thesis really maintained by his victims, that the account of the early development of Socrates given in the *Phaedo* is substantially correct, the hollowness of his rhetoric would be apparent at once. It may be a mistake on our part—Burnet's and my own—to think that Plato, like Kant, only attained his final philosophical position in late middle life, but we are not shown to be wrong by such *ad captandum* eloquence as this.

Having now discharged my conscience of a rather unpleasant duty, I am glad to turn to the more congenial task of commending the great bulk of Professor Shorey's book *ex animo*. Indeed that a reasoned synopsis of the dialogues by Professor Shorey would be an excellent book is a thing which hardly needs to be said. He has always had the gratitude and respect of some of us whom he seems to mistake for plagiarists for the eminent common-sense and sound judgment which has led him for so long to withstand all the once fashionable theories which dissected Plato's greatest dialogues into 'strata' flung together at haphazard, or reduced them to strings of petty 'scores' off second-rate contemporaries. (If only I could persuade Professor Shorey that expressed agreement with him on these points, while it no doubt means that a younger man has found his *Unity of Plato's Thought* among the most instructive books he has read, does not mean 'plagiarism'. One cannot well plagiarize from a work which one has studied with delight on its publication, and then not read for years.) The discussion, for example, of the relations of Plato with Isocrates and with Antisthenes, about which a whole literature of fanciful nonsense has been written, is a model of judicious sobriety, and no less

admirable is the wise caution (p. 25) against finding too readily in Plato's writings evidence for the truth of the later stories about his travels. (Though I own that the remark of the Athenian in the *Laws* about the persistence of stereotyped artistic form in Egyptian art seems to me almost certainly that of a man who is reproducing his own personal impressions of the monuments.)

On the question of the Platonic Canon Professor Shorey is, on the whole, judiciously conservative. I observe that the *Epinomis* is treated along with the genuine dialogues, not relegated to the *dubia* and *spuria*, though some of the things said about it would seem to show that in the writer's view it is probably not genuine. (I have tried to reply to the latest linguistic arguments on the point, those of F. Müller, in a brochure which seems not to have come into Professor Shorey's hands.) I note that *Alcibiades I* appears to be definitely given up; I could wish it had been considered whether it may not be possible, after all, to save *Hipparchus* and *Clitophon*. As I do not remember whether Professor Shorey has given an opinion on the question before (as he may very well have done), I am particularly glad to have his authority for the view that the *Protagoras* is not an early dialogue, but belongs to the same general period as Plato's other greatest artistic creations.

In the great bulk of the book, which consists of ably condensed statements of the arguments of the dialogues, there is naturally not much upon which difference of opinion can arise. I could wish simply to congratulate Professor Shorey on the skill and conscientiousness with which the work has been done, and to express the hope that the treatment of Plato's relation to science, without which the mere abstract of such a work as the *Timaeus* is necessarily incomplete, will not be long delayed. If there is any point in the exposition about which I feel a doubt, which I fancy I shall not be alone in feeling, it is the marked tendency of the author of the *Unity of Plato's Thought* to minimize all evidence of any serious development in Plato's thinking after mid-life. If Professor Shorey finds it hard to believe that so great a philosopher as Plato had not finally "found himself" before the age of fifty, I find it still harder to think that, to speak in the rhetorical style of Professor Shorey, such a man 'never had another original thought' between the ages of fifty and eighty. But I suspect that the difference between us here is very much one of emphasis, and looks on the surface more considerable than it really is.

I observe that a slight misunderstanding of Burnet has found its way into the notes on the *Theages* and *Rivales*. Burnet is said there to have accepted these dialogues as genuine when he edited his text. This, as I know, is a misconception. Burnet printed under the name of Plato the whole matter contained in the traditional "tetralogies", only excluding the heading Πλάτωνος from the material recognized

in antiquity as spurious. (I happen to know that in his personal opinion Burnet was dubious about the *Menexenus*, a work which seems to me, as it does to Professor Shorey, certainly authentic.) There is, I believe, another little oversight in a note about myself which 'sets me right' about a passage in the *Symposium*. I do not think I ever made the suggestion that Agathon is represented as annoyed by Socrates' comments on his eloquence, and there is certainly nothing to this effect in my chapter on the dialogue in my book on Plato. If I have anywhere said such a thing in some forgotten article, though I do not think I have, I bow to Professor Shorey's correction.

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Prolegomena to a New Metaphysic. By THOMAS WHITTAKER. Cambridge, The University Press, 1931. Pp. 120.

Those who have followed Mr. Whittaker's learned and ingenious attempts to construct a modern metaphysics on fundamentally Neo-Platonist principles will find little of novelty in his new essay, for it does not add much to what he has already put before us, especially in his *New Metaphysic of Evolution*, written in 1912 to 1913, but first published in 1926 in the volume entitled *The Metaphysics of Evolution and Other Essays*. In fact the compression of the present treatment makes his position difficult of understanding, except in the light of the earlier and fuller discussion, to attempt even a summary account of which would necessarily take us beyond the limits of this notice. Mr. Whittaker is now able to refer, however, to certain recent developments in science and metaphysics as tending, so far as they go, to confirm some of the views that he had already adopted. Thus he finds support for his own radical idealism in Professor Whitehead's new "philosophy of organism" with its acceptance of "the subjective principle . . . that the whole universe consists of elements disclosed in the analysis of the experiences of subjects". And he can now point to Sir James Jeans' acceptance of a premundane intellect or thought as the ground of the universe as in line with his own philosophical principles, and to the same writer's argument on astronomical grounds for a beginning of the universe as providing confirmation from the side of science for a view that he had himself previously reached by metaphysical reasoning.

The discussion of pragmatism at the beginning of the first chapter, however, gives us a fuller account than he has elsewhere provided of the author's attitude toward this tendency. In the Prologue to *The Metaphysics of Evolution* he had written, "I do not put forward this essay . . . as definitive dogma. I am quite aware of the imaginative

and hypothetical elements it contains; but my deliberate opinion is that for further progress the modern mind must cease to be afraid of hypothesis and imagination as aids in the search for truth not only in science but in philosophy". And he recognized the value of pragmatism in so far as it seemed, by way of "concession to the speculative metaphysician", to have reintroduced into modern thought "a new permission of intellectual adventure". But, says he, "in what is now written from the pragmatic point of view I feel more and more a steady drift to the overwhelming of all contemplation in the unexamined practical life of today". Hence the necessity of a protest. Unable "to educe a pragmatic system from any of the actual representatives of the doctrine" he chooses instead "to 'construct' the pure pragmatist from the idea of truth as 'biological value' ", and proceeds to urge, as against a pragmatism hypothetically so defined, "that sound theory of knowledge, spontaneously detaching itself from subordination to factors of volition directed to practice, has been evolved by the intellect as a continuous thread running through the history of philosophy. Theoretical tests of truth do not remain to be created, but already exist; and, with the aid of progressive scientific theory, can be applied to the investigation of the nature of reality."

In the Additional Note at the end of the volume Mr. Whittaker takes occasion to protest against the "acceptance of the 'Platonic Epistles' as genuine letters of Plato". Those who find themselves at all inclined, in company with a distinguished group of contemporary scholars, to such acceptance, will be unlikely, I think, to meet in Mr. Whittaker's brief discussion with anything at all calculated to alter their view of the matter. He is doubtless right in holding that "Plato from the beginning to the end of his career was a philosopher, influenced no doubt by others, and above all by Socrates, but never aiming purely and simply at artistic reconstruction of other men's thoughts". But is it so clear as he seems to suppose that this is inconsistent with the genuineness of the Seventh Epistle? The author of the Epistle, says Mr. Whittaker, declares his "intention never to write a treatise of his own on philosophy". But it is scarcely evident that any of Plato's writings is to be viewed as such a treatise on philosophy as the writer of the Epistle has in mind. Mr. Whittaker instances the *Timaeus*. But one may well doubt whether it altogether qualifies, even granting that Plato would not have written this work had he not felt that there was "a good deal in" such a view of things as Timaeus there expounds.

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The Physical Basis of Rime. An Essay on the Aesthetics of Sound. By HENRY LANZ. Stanford University Press, 1931. Pp. xiv, 365.

The aim of this book is to expound the part played by the physical science of acoustics in an adequate aesthetics of rime. The characteristic physiognomies of several well-known lines of verse are graphically exhibited in reproductions of photographic plates. A number of charts are given to show the approximate musical equivalents of vowel sequences in verse fragments or rimes. The artistic problem of the significance of different kinds of rime for verse is discussed in the light of these physical facts, musical analogies, and the history of theories of rime and national preferences in the music of verse at different epochs. Mr. Lanz draws his examples from a wide variety of languages, notably Russian, in addition to the more commonly known languages.

The total drift of the book is decidedly illuminating and helpful for the student of aesthetics who makes his approach from the "literary" or more "narrowly" philosophical side, though I think confinement to a limited method is not common in the philosophical disciplines today. Mr. Lanz shows conclusively that verse with its elements of rime and rhythm, and their elements again of various vowel and consonant structures, is not metaphorically but literally a kind of music. The accented vowels of rime furnish a point of reference like the key of a melody. The function of the consonants on the whole is rhythmic rather than melodic; they are time-beaters, drum-taps. Mr. Lanz calls attention to the frequent occurrence of a preference for complexity and variety in vowel melody and consonantal rhythm analogous to the contemporary sophisticated preference for music in which reference to key is not obvious or is absent. As Euler began the movement in modern times in which purely musical phenomena are scientifically analyzed into mathematical ratios, so Mr. Lanz is part of a movement to interpret verse melody, harmony, and rhythm as vibration-frequencies and ultimately as mathematical ratios. In these theories measure instructs and rationalizes mere blank "infinite" sensation as Plato taught that it did in acceptable art. But the author sensitively limits the relevance of mathematical physics to aesthetics. He writes: "No attempt is made here to 'reduce' the aesthetic phenomenon of rime to purely physical factors. Science claims no reductions. One who dogmatically believes in the possibility of reducing such phenomena as consciousness, beauty, or rhythm to their physical components oversteps the legitimate boundaries of science and falls into metaphysics. . . . No amount of physical insight into the matter can be regarded as a substitute for what has already been attained in it historically, philologically, or aesthetically"

(pp. 4, 5). His tribute to the importance of Hegel's theory of rime illustrates the justice of this claim (pp. 171 ff.).

There is, however, one philosophical contention pressed again and again by the author which seems to me to go too far, though it undoubtedly contains truth as against an outworn theory. The music of verse, he argues, expresses not some vague inner romantically conceived emotion, but creates and matches point for point the emotion conditioned by that particular vowel melody and consonantal rhythm in question. The doctrine of the specificity of aesthetic emotion is here defended at its logical limit. Mr. Lanz refers to Hanslick's theory of the independence of musical ideas (pp. 273 f.). Doubtless the C major tonic triad conditions the C major tonic triad emotion and not, as he repeatedly insists, "the great C major of life". But while the particular tonal and rhythmical relationship certainly gives the final qualifying touch to the shape of the relevant emotion, it seems to me consciousness irrefragably testifies to an inward corresponding to this outward. Experts in the various arts had, a few years ago, to defend themselves against the cloudiness of aestheticians who saw the sentiment of eternal motherhood ideally embodied in pigment, and love and hate in general extrinsecating themselves in fugues and preludes. But love in general is no more an inward state than an outward, and yet some shade of it seems to link itself with outward expressions. Can there not be a "characteristic frequency" of love which only the particular vowel music of a Shakespearean sonnet could communicate? At least creative artists have firmly believed, as Mr. Lanz himself points out, that their technical devices incarnated spiritual feelings. I believe their testimony is worth reëxamining. Moreover, he is willing to believe that blank verse and revolutions go somehow together. I suppose revolutions work from within out, as love does. The general point cannot be argued in a book-review, but the indications distinctly point to a return to centrality on this matter. Witness Mr. Louis A. Reid on the direct expressiveness of colors: "If pink is 'feeble' or 'vulgar', it is not feebleness or vulgarity in general, but 'pinky-feeble' and 'pinky-vulgar'. Or if violet or blue expresses delicacy or mystery, it is not delicacy or mystery *apart* from blue, but 'blue-mystery' or 'violet-mystery' ".[1]

Mr. Lanz refers his philosophical position in the last resort to the modern repudiation of ontology, whether mentalism or materialism. Of course, in this he is right. The only difficulty is that the view he represents does not go far enough in the repudiation. The substitution of the phrase "neutral entities" for mental or material stuff is inadequate, not only, as he says, because "entity" savors of static being,

[1] *A Study in Aesthetics*, 1931, p. 77.

but also because, which he does not say, "neutral" still involves a reference to "stuff". Values or functions are out of the context of stuff entirely, whether mental, material, or neutral. Things are, as Hegel taught, what they mean.

KATHARINE GILBERT

DUKE UNIVERSITY

The Logic of Science. By HAROLD R. SMART. New York and London, D. Appleton and Co., 1931. Pp. 237.

What Professor Smart understands under the logic of science is not a systematic body of fundamental principles upon which scientific knowledge rests, but simply a collection of problems of a more or less philosophical character which arise within various sciences, but can neither be solved, nor even approached, with the so-called scientific, or empirical, methods, and therefore call for a philosophical speculation even on the part of the scientist himself. The author undertakes to discuss such questions as the relation between commonsense and science, between philosophical and scientific methods, between deduction and induction. He instructs the reader as to the meaning of Hilbert's axiomatics and Brouwer's intuitionism, Cantor's transfinite numbers and Weierstrass' arithmetization of pure mathematics, Einstein's theory of relativity, and the quantum mechanics. In the chapter on biology, guided largely by Haldane and Thomson, he discusses at length the mechanistic and vitalistic conceptions of life, refusing to side with either of them and offering a possibility of escape from the impasse by advocating methodological teleology. On the whole the book is a miniature encyclopedia on modern scientific controversies. It serves very well the purpose of bringing to the attention of the scientist the important message and the need of philosophy, and of reminding the philosopher of his professional obligations toward science. But it fails to construct systematically what the title of the book suggests: the discipline of scientific logic.

However, within the scope intended and clearly announced in the preface the author succeeded in accomplishing the worthy task of compelling "all thinking people to reflect on the significance of science for human life as a whole". There are a number of interesting and stimulating remarks scattered throughout the book, a wealth of skillfully chosen and significant quotations, and above all frequent and sympathetic references to philosophical classics—an attitude rather unusual among modern logicians with scientific leanings. In contrast to some of "our wise contemporaries" Dr. Smart is willing to listen—to use Bertrand Russell's sarcastic remark—to "what Hegel has to say about mathematics". In fact he delicately and rather bravely reminds Mr. Russell that in his analysis of numerical diversity the latter "unconsciously" agrees with Hegel as to the essential character of

quantitative determination. The Hegelian concept of *Gleichgültigkeit* has really found its best formulation in Russell's famous definition of mathematics as "the subject in which we never know what we are talking about, nor whether what we are saying is true". Dr. Smart's chief advantage is that he combines profound philosophical interest with a professional training and amazingly wide information in the field of science.

HENRY LANZ

STANFORD UNIVERSITY

Literature and Pulpit in Medieval England. A Neglected Chapter in the History of English Letters and of the English People. By G. R. OWST. Cambridge, The University Press, 1933. Pp. 616, xxi.

This extraordinarily good work of research, by the foremost authority on mediaeval sermons, may well have a great effect upon the future study of English letters. It admirably analyzes and illustrates the literary influences of the English sermons of the Middle Ages and the contributions which the sermons make to social history. For England this has never before been done, and those of us who, from a slight acquaintance with sermon literature, have surmised that this neglected field contained mines of very significant and very interesting material and have disdained to sneer at the 'dull reading' the sermons are alleged to provide, welcome this book with deep satisfaction. Indeed these 596 pages are well and enthusiastically written; the book is erudite, well-ordered, discriminating, and the plenteous mass of material well digested. The footnotes, numbering over 2500, will keep busy for many a year many a student who, in search of sources, wisely has recourse to them. Already to my knowledge the book has inspired new research and the ambition to edit some of the sermons the author brings to view, and one may confidently expect a renewed activity in Canada, France, and this country. Dr. Owst intends next to consider the theological aspect of the sermons. When he has done that, he will have rounded out his studies of the mediaeval sermon and thus immeasurably enriched our knowledge of the period. Hitherto mediaevalists have seriously erred; in neglecting the sermon they have passed by the most abundant literary product and most persistent intellectual influence of the Middle Ages. Readers of the present journal especially should await this next book, for it will doubtless illumine one prominent activity of scholasticism.

The way is now pointed for further research on the part of students of history, literature, rhetoric, or preaching. They will next set to work upon a comparison of contemporary English and Continental sermons, or upon the engaging task of investigating the correlation between the practice and the rhetorical theory, as set forth in the *Artes praedicandi.*

There are nine chapters in the book, and so uniformly clear and cogent is each that it would be hard to say which contributes most. The first is entitled Introductory Influences, Linguistic, Romantic, and Realistic, and explains how the characters and scenes of everyday life formed a basis for realism in the English literature to come. The second deals with Scripture and Allegory, makes clear how the mediaeval methods of scriptural interpretation heightened and enriched, for literary treatment, the subjects in Holy Writ, and offers a pertinent study of Bunyan. "The Heavenly Host" deals with Biblical characters and scenes and the preachers' attitude to images. An excellent chapter, treating of Fiction and Instruction in the various types of sermon *Exempla,* follows. Then come three chapters on the Preaching of Satire and Complaint, taking up in detail the preachers' views of clergy and laity, the classes of society, and domestic life. Chapter VIII deals with Sermon and Drama, and the last, a Literary Echo of the Social Gospel, contains a striking discussion of Langland. An Appendix is devoted to the influence of satire in preaching upon satire in later mediaeval church art, and there is an Index. The continuity of tradition from sermon literature to Gower, Chaucer, and Shakespeare is in the course of the book plainly and forcibly proved.

Among the numerous works Dr. Owst has used, he seems to find one of his richest sources in John Bromyard's *Summa praedicantium;* it is right that this great treatise should come into its own.

I have caught only two slight errors. On p. xx, n. 1, the tract on preaching cited, in Mazarine MS 569 (*Tractatus Joannis Gallensis*) is, as examination shows, not identical with the Bodleian, London, and Cambridge copies of Thomas Waley's *De theoria sive arte praedicandi,* which indeed were first brought to light by Dr. Owst himself in his former book, *Preaching in Medieval England;* and Honorius 'Augustodunensis', indicated on pp. 3, 201, and 516, should not be referred to as Honorius of *Autun.* But it would of course be puerile to regard these two petty points unduly in a book that so deepens our understanding of mediaeval English sermons and life, and of contemporary and later English literature.

HARRY CAPLAN

CORNELL UNIVERSITY

DESCRIPTIVE NOTICES

Rule and End in Morals. By JOHN H. MUIRHEAD. New York, Oxford University Press, 1932. Pp. 120.

The revered author of *The Platonic Tradition* here surveys the twentieth century falling away at Oxford (through Prichard, Rashdall, Carritt, Ross) from Idealism in ethics, and the more recent signs of a return to the tradition (through gestures of Field and Pickard-Cambridge, more explicit declarations by Stocks and de Burgh, and forthright manifestations from Joseph). The return, however, is a considered performance—wiser in recognition of difficulties, wiser in positive insights. Muirhead is a model umpire presiding over Oxford dialectics, and ventures many mediating suggestions, all converging upon a restatement of morality that would make right and good, rule and end, coördinates—"together forming the Frame of Reference within which . . . the good life has to be lived by each of us".

T. V. SMITH

UNIVERSITY OF CHICAGO

The Six Ways of Knowing. A Critical Study of the Vedānta Theory of Knowledge. By D. M. DATTA. London, George Allen and Unwin, Ltd., 1932. Pp. 352.

The six great schools of Indian philosophy are all too little studied in the West. Our philosophy departments fight shy of them, partly because they are connected with the practical end of salvation. But so is Plato and many another western philosopher. Perhaps the real reason is the difficulty of translating Sanskrit terms, and of connecting with western systems those which have grown up with an entirely different background. But this book is a serious attempt to show that there *are* systems of Indian epistemology akin to our own and it should be given the attention of scholars in this field. It reveals the fact that while western philosophy recognizes perception and inference the Indian systems recognize from one to six such sources of knowledge, and it deals in detail with the Vedānta, or monistic school, which holds the field in India. It even makes the rather bold attempt to relate this great system to such modern western psychology as that of the *Gestalt* School. It also criticizes other Indian systems and to some extent traces their development. It is indeed a worthy companion volume to Dr. Hu Shih's *Development of the Logical Method in Chinese Thought* and like that admirable work should be studied by those who are competent to help these writers in their task of building a bridge between the systems of east and of west. Certainly the old idea that a few Greeks and a few Germans have between them done all the serious philosophical thinking of the race will no longer hold, and in the present confusion of philosophical thought light from the ancient East should be offered a warm welcome. But will our present astigmatism allow this? Most critics will, I fear, content themselves with a rebuttal of those paths to knowledge which they themselves do not recognize. Of Jñana (intuition) American philosophy does not make enough. India has for twenty-eight centuries enthroned it: as the Neo-platonists say, "Nous is king". Dr. Datta has some timely comments upon the fallacies of pragmatism, upon words as symbols and upon

other interesting topics too numerous and complex for a brief review, too technical for the present reviewer.

KENNETH SAUNDERS

Is Divine Existence Credible? By NORMAN KEMP SMITH. New York, Oxford University Press, 1931. Pp. 28.

The object of this lecture before the British Academy is to discover the positive grounds for the prevalent disbelief in the existence of God, and in so doing perhaps to reveal the credibility of divine existence. The author proceeds first to an examination of the curious inconsistency of Hume and Kant, both of whom reject the argument from design and yet admit the facts of design. He finds that this attitude is due to a confusion between the observation that nature produces an impression which is sometimes overwhelming and the misinterpretation that this impression is one of design. This and other defects in the argument from design necessitate the sceptical conclusion that any attempt to infer the existence or nature of the divine from the creaturely is impossible. But if the divine cannot be reached by argument, the one remaining alternative must be accepted, that we experience it in a direct and immediate manner. Such an immediate experience is analogous to that whereby we are aware of ourselves and other persons. Following the acute analysis of the argument from design, this part of the lecture is a trifle disappointing. One may conclude that, since the way of immediate experience is always open, divine existence is at least not incredible.

J. R. CRESSWELL

WEST VIRGINIA UNIVERSITY

An Analysis of the Group Concept. A Thesis. By HAZEL MAY HUSSONG. Philadelphia, The University of Pennsylvania Press, 1932. Pp. 100.

This monograph classifies the chief historical definitions of the group as morphological, physiological, psychological, and teleological, but declares that all these are analogical theories. The last chapter is an attempt to treat the group empirically rather than in the traditional analogical way. An index to the various philosophers and sociologists mentioned would have been useful.

MABEL V. WILSON

ITHACA, N.Y.

Harriet Martineau: An Example of Victorian Conflict. A Thesis. By NAROLA ELIZABETH RIVENBURG. Philadelphia, The University of Pennsylvania Press, 1932. Pp. iv, 112.

The dissertation shows that the writings of Miss Martineau form a valuable and humanly interesting commentary on the social and economic movements of nineteenth century England. Her application of the laissez-faire doctrine to problems of labor, taxation, education, and foreign affairs is typical of the period, yet sometimes involves conflict with it. References to Smith, Mill, Comte, Carlyle, and de Tocqueville are of considerable interest.

MABEL V. WILSON

ITHACA, N.Y.

Music and Meaning. By ELIZABETH ROBINSON WOODS. Cambridge, Harvard University Press, 1932. Pp. x, 102.

The basal thesis of this book is that meaning is structure and is primarily aesthetic, not referential or symbolic; the sort of meaning that is characteristic of a sign or symbol (extrinsic meaning) either involves an infinite regression or in the end rests on the sort of meaning which is an integrated structure (intrinsic meaning). This thesis is developed and defended under the following topics: intrinsic and extrinsic meanings, music and representation, meaning and denotation, meaning and value, and meaning and substance.

G. WATTS CUNNINGHAM

CORNELL UNIVERSITY

Immanuel Kant in England (1793-1838). By RENÉ WELLEK. Princeton, Princeton University Press, 1931. Pp. viii, 320.

This is a very thorough study of the history of Kant's introduction and reception in England up to the year 1838 (the year in which the first complete English translation of the *Critique of Pure Reason* was published, the translation by Francis Haywood). Approximately seventy pages are devoted to a consideration of Kant's influence on Coleridge, and a chapter is devoted to The Romantic Generation (Henry Crabb Robinson, Wordsworth, Southey, Hazlitt, De Quincey, Carlyle) and Kant. The two "strange enthusiasts", Henry James Richter and Tomas Wirgman, are also dealt with in considerable detail. The book is an important contribution to the history of British philosophical speculation.

G. WATTS CUNNINGHAM

CORNELL UNIVERSITY

Linguistic Analysis of Mathematics. By ARTHUR F. BENTLEY. Bloomington, Indiana, The Principia Press, 1932. Pp. xii, 316.

The purpose of this book is to analyze and render precise the language in which the foundations of mathematics is embedded. The author offers some acute analyses of the language employed by Hilbert, Brouwer, Weyl, etc., and invents new terminology. He does not, however, attempt a constructive formulation. In opposition to Cantor, the author proposes a method of enumerating the class of non-ending decimals. The book contains some useful bibliographies on foundations.

V. F. LENZEN

UNIVERSITY OF CALIFORNIA

La méthode scientifique. Par ALEXANDRE PERIETEANU. Paris, Félix Alcan, 1933. Pp. 204.

The first chapter of this book contains an empirical analysis of scientific knowledge in general, and the conclusion is reached that there are as many sciences as there are distinctive points of view from which nature can be regarded. The nature and procedures of reasoning are then discussed, and this discussion is followed by a description of certain basic conceptions of the several sciences, subdivided for this purpose into two classes, general and special. The former class (including the various branches of physics) studies the properties revealed by sensations, independently of the things

which possess them. The latter studies things, or groups of sensations and their variations, in abstraction from the rest of the world. This class includes chemistry, the biological sciences, sociology, philosophy, and so on. The author declares that scientific method in its entirety may be comprised under the heads of observation, abstraction and comparison. The various branches of mathematics he conceives, not as sciences, but rather as procedures or operations of measurement, irrespective of the character of the objects measured.

H. R. SMART

CORNELL UNIVERSITY

Œuvres de Maine de Biran. Accompagnées de notes et d'appendices publiées avec le concours de l'Institut de France. Tomes VIII and IX. Par PIERRE TISSERAND. Paris, Félix Alcan, 1932. Pp. lxxii, 652.

These two volumes of the edition which will comprise fourteen volumes when completed present the most important and systematic presentation of de Biran's doctrine. M. Tisserand's introduction provides both the bibliographical information and the analysis of de Biran's problems and interests necessary for historical appreciation.

ALBERT G. A. BALZ

UNIVERSITY OF VIRGINIA

Philosophie ein unlösbares Problem. Abrechnung mit der Illusion. Von LUDWIG FREUND. München, Ernst Reinhardt, 1932. Pp. 56.

This study is a critical clarification and continuation of the point of view of the author's work, *Am Ende der Philosophie.* Freund considers various philosophers and finds them all obsessed by an illusion, attacking an insoluble problem—the search for world-views, final solutions, complete explanations. Critical-philosophic thought abandons this search and concentrates upon the explanation of problematic, obscure, and unexplained concepts. Philosophy is a principle of correction and the philosophical problem is—as Freund reveals in an analysis of historical insight—the weighing of methods of study, the criticism of concepts, the determination of the degree of certainty of judgments.

NORBORNE H. CROWELL

POTSDAM, NEW YORK

Wilhelm Diltheys Methode der Lebensphilosophie. Von KENZO KATSUBE. Hiroschima, Philosophisches Institut, 1932. Pp. 188.

This is a scholarly, sympathetic work, with unusual insight into the difficulties of Dilthey's position. It discusses: (a) Life as the primitive datum, philosophy as reflection of life upon itself; (b) the endeavor to attain a more adequate comprehension of life in the moral sciences through the methodological triad of immediate experience, understanding of other life and its types, and the formulation of data (thus obtained) under categories founded upon a structure immanent in life itself; (c) the conflict between scientific positivism in Dilthey and the tendency to reach out toward some complete, metaphysical grasp of life through his category of "meaning", the relation of the parts to the whole of life. The author concludes that Dilthey, though still caught in Western science, methodology, and love of

restless change, has opened the way toward more profound understanding of life as the East has sought it, in contemplative and inward peace.

GEORGE A. MORGAN, JR.

HAMILTON COLLEGE

An Introductory Logic. By JAMES EDWIN CREIGHTON. Fifth Edition, Thoroughly Revised, with the Addition of New Problems and Examples, by HAROLD R. SMART. New York, The Macmillan Company, 1932. Pp. xvi, 496.

The changes made in this widely used textbook will measurably increase its usefulness. The portions dropped are, for the most part, such as tended to divert attention from more significant problems. The new sections give some inkling, at least, of that wider calculus of which the logic of Aristotle and the logic of Mill are but particular provinces. The stylistic alterations make for compactness and greater clarity of expression. One may regret, however, that in the account of the "either . . . or" type of statement room has not been made for the merely alternative proposition, as distinguished from the disjunctive.

RAY H. DOTTERER

PENNSYLVANIA STATE COLLEGE

Responsibility: Its Development Through Punishment and Reward. By LAURENCE SEARS. New York, Columbia University Press, 1932. Pp. x, 198.

This book, which attempts to formulate a theory of moral responsibility on an empirical basis, is divided into three parts. The first is an examination of four types of ethical theory: the utilitarianism of Bentham, Mill and Bain, the evolutionary ethic of Westermarck, the idealism of Green and Bradley, and the pragmatic theory of Dewey. Then follows a study of the development of responsibility in twelve problem-children; and a re-examination of ethical theories in the light of the empirical data so introduced. The conclusion is that moral problems are essentially social problems, and that freedom is "intelligent choice between available possibilities". To the Socratic query, "Can virtue be taught?", Mr. Sears answers: "No! but intelligence may be developed, and that is the essence of virtue, as it is of responsibility".

C. M. WILTSE

ITHACA, NEW YORK

Determinism and Law. By WILLIAM G. SCHMIDT. Philadelphia, University of Pennsylvania Press, 1931. Pp. 72.

Mr. Schmidt defines determinism as a "general theory concerning the extent and the application of the field of causation", which makes "no assertion of any kind as to the nature of the cause" (p. 18). Applying this definition to criminal justice, he reasons that punishment must take into account the causes of the specific crime, be they psychological, biological, or social. Sentences should be indeterminate for all offenses, the release of the prisoner being "left entirely to a board of technicians able to predict, with reasonable accuracy, his future conduct" (p. 68).

C. M. WILTSE

ITHACA, NEW YORK

A Philosopher Meets a Novelist. By V. J. McGill. Ithaca, The Dragon Press, 1932. Pp. 150.

The author offers suggestive observations on the relations between philosophy and literature in a series of semi-humorous dialogues between the philosopher and his friends the Novelist and the Critic. Such problems as the reality of the fictional, the principle of individuation, the possibility of having an intelligent hero, and the relation of character-types to dominant value-attitudes are discussed in a running conversation, interrupted by essays on the nature of personal identity and Henry James's use of the detective story. The author shows thorough familiarity with classic and current fiction as well as philosophy but the dialogue lacks unity and decisiveness.

GEORGIA HARKNESS

ELMIRA COLLEGE

The following books were received during the months of August and September:

Examination of McTaggart's Philosophy. Volume I. By C. D. Broad. New York, The Macmillan Company, 1933. Pp. lvi, 460.

Some Reflections on Culture and Liberty. By Jacques Maritain. Chicago, The University of Chicago Press, 1933. Pp. 52.

George Kaiser's Dramatic Works: His Social Dialectic. By Moses Joseph Fruchter. Philadelphia, 1933. Pp. 90.

The Logic of Science. By William G. Ballentine. New York, Thomas Y. Crowell Company, 1933. Pp. 230.

Consciousness: Brain-Child. By Percy A. Campbell. Cleveland, The Caxton Co., 1933. Pp. 110.

The Quest of Solitude. By Peter F. Anson. New York, E. P. Dutton & Co., 1933. Pp. xviii, 278.

A Survey of the Science of Psychology. By J. R. Kantor. Bloomington, The Principia Press, 1933. Pp. xviii, 564.

Algazel's Metaphysics. A Mediaeval Translation. Edited by J. T. Muckle. Toronto, St. Michael's College, 1933. Pp. xx, 248.

Initiation à la philosophie contemporaine. Par Henri Serouya. Paris, La Renaissance du Libre, 1933. Pp. 314.

Récherches philosophiques. Publiées par A. Koyré, H.-Ch. Puech, A. Spaier. Paris, Boivin et Cie, 1933. Pp. viii, 624.

L'Inde antique et la civilisation Indienne. Par P. Masson-Oursel, H. De Willman-Grabowska, Philippe Stern. Paris, La Renaissance du Livre, 1933. Pp. xx, 500.

Die ontologischen Grundlagen der neueren Erkenntnislehre. Von Eckardt Günther. Halle (Saale), Max Niemeyer, 1933. Pp. 32.

Philosophie in Merksätzen. (I. Geschichte der Philosophie.) Von Hugo Ehlers und Hans Feist. Berlin und Leipzig, Walter de Gruyter & Co., 1933. Pp. viii, 152.

NOTES

Dr. Woodbridge Riley died on September 2, 1933, in his sixty-fifth year. He graduated from Yale University with the B.A. degree in 1892. He received the A.M. degree from the same institution in 1898, and the Ph.D. degree in 1902. He was instructor in English at New York University, 1897-8; acting professor of philosophy at the University of New Brunswick, 1902-4; Johnston research scholar at the Johns Hopkins University, 1904-7; and professor of philosophy at Vassar College since 1908. In 1920 he was appointed lecturer for the year at the Sorbonne. Among his works are: *American Philosophy*, 1907; second edition, 1923; *Le Génie Américain*, 1921; *From Myth to Reason*, 1926; *Men and Morals*, 1929; *The Meaning of Mysticism*, 1930. He was joint author of *The Faith, Falsity, and Failure of Christian Science*, 1925.

The following is a list of articles in current philosophical periodicals:

MIND, XLII, 167: *H. H. Price*, Mr. Stace on the Construction of the External World; *C. D. Broad*, Prof. Hallett's Aeternitas (II); *D. R. Cousin*, Aristotle's Doctrine of Substance; *L. S. Stebbing*, Mr. Joseph's Defence of Free-thinking in Logistics.

PHILOSOPHY, VIII, 31: *R. Hackforth*, Great Thinkers. (1) Socrates; *Clement C. F. Webb*, Two Philosophers of the Oxford Movement; *W. G. de Burgh*, Croce's Theory of Economic Action; *C. Delisle Burns*, The Sense of the Horizon; *Adrian Coates*, A Pluralistic View of History; *Sydney E. Hooper*, Professor Whitehead's Adventures of Ideas.

THE JOURNAL OF PHILOSOPHY, XXX, 15: *Sarah H. Brown*, The Right and Good: Methodology in Ethics; *Henry Nelson Wieman*, On Using the Word "God". 16: *Clifford Barrett*, Is Idealism Realism? A Reply in Terms of Objective Idealism; *Edgar Sheffield Brightman*, The Definition of Idealism. 17: *Bruce W. Brotherston*, The Empirical Method in Philosophy; *George N. Belknap*, The Commensurability of Values.

THE HIBBERT JOURNAL, XXXI, 4: *W. Watkins Davies*, Justice in International Affairs; *Ronald Symond*, Justice in the Teaching of Jesus; *S. F. Darwin*, "Equality of Opportunity"; A Fallacy of To-day; *G. C. Chatterji*, Are the Christian Values Final?; *M. C. D'Arcy, F. L. Cross*, and *Henry Gow*, Dr. Orchard's Passage "From Faith to Faith"; *L. V. Lester-Garland*, Plato, Aristotle and Catholicism; *D. F. Fraser-Harris*, Bisexual Mentality; *A. W. Harrison*, Romanticism in Religious Revivals; *G. M. Sargeaunt*, The Wisdom of Maria Rilke; *Arthur Darby Nock*, The Study of the History of Religion; *James Moffatt*, Survey of Recent Theological Literature.

THE JOURNAL OF RELIGION, XIII, 3: *Shailer Mathews*, The Function of the Divinity School; *Millar Burrows*, Jew and Arab in Palestine; *D. C. Holtom*, Konko Kyo—A Modern Japanese Monotheism; *Conrad Henry Moehlman*, The Origin of the Apostles' Creed.

ANGLICAN THEOLOGICAL REVIEW, XV, 3: *Theodore Otto Wedel*, College Students and God; *Douglas Horton*, The Oxford Movement and Contemporary American Protestantism; *William M. V. Hoffman, Jr.*, Personal Counselling; *John R. Crosby*, On the Canon Law.

PSYCHOLOGICAL REVIEW, XL, 5: *Edward Chace Tolman,* Gestalt and Sign-Gestalt; *Raymond H. Wheeler, F. Theodore Perkins,* and *S. Howard Bartley,* Errors in the Critiques of Gestalt Psychology IV. Inconsistencies in Woodworth, Spearman and McDougall; *Edward L. Thorndike,* A Theory of the Action of the After-Effects of a Connection upon It; *David Ballin Klein,* Psychology and Freud; *Carl N. Rexroad,* An Examination of Conditioned Reflex Theory; *Orvis C. Irwin,* Proximodistal Differentiation of Limbs in Young Organisms; *D. A. Worcester,* In Defense of the Whale—Emotion is at Least a Term of Convenience.

JOURNAL OF EXPERIMENTAL PSYCHOLOGY, XVI, 4: *C. R. Garvey,* A Study of Conditional Respiratory Changes; *J. A. McGeoch* and *H. N. Peters,* An All-or-none Characteristic in the Elimination of Errors During the Learning of a Stylus Maze; *C. W. Telford* and *N. Thompson,* Some Factors Influencing Voluntary and Reflex Eyelid Responses; *M. Luckiesh* and *F. K. Moss,* A Correlation between Illumination Intensity and Nervous Muscular Tension Resulting from Visual Effort; *M. S. Viteles,* The Influence of Training on Motor Test Performance; *H. C. Taylor,* The Fundamental Pitch of English Vowels; *K. L. Smoke,* Negative Instances in Concept Learning; *A. L. Winsor* and *E. I. Strongin,* The Effect of Alcohol on the Rate of Parotid Secretion; *L. D. Goodfellow,* An Empirical Comparison of the Various Techniques used in the Study of the Localization of Sound; *W. Varnum,* A High-Speed Chronograph; *W. W. M. Babb,* Correction.

PSYCHOLOGICAL BULLETIN, XXX, 7: *Rudolf Pintner,* Educational Psychology Number.

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